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Effectiveness of Child Health Programs in Ontario by Survey Methods*

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THE statistical incongruities associated with the annual reports of certain municipalities organized for work in the field of child hygiene, led the writer, some years ago, to attempt to arouse interest in accurate recording of local effort. This was beset with difficulties. Early in 1930, the department offered to assay the services in certain representative communities. The study upon which the data used in this paper are based was commenced in March, 1930, and completed only a few weeks ago. Our findings are presented with the belief that conditions in Ontario do not differ materially from those in other comparable provinces in Canada, or states in the United States.

While 13 cities were included in the survey, the infant and preschool effort was not studied in 2—Toronto and Peterborough. The school health service was reviewed in 12. The local objectives were noted, and the records of work performed and results obtained in certain, selected years, were intimately examined.

The difficulties confronting the staff were even greater than I had imagined they might be. In most of the cities, records of work performed were kept on inappropriate forms, or on no forms at all. Calls made, consultations, or other efforts were unrecorded or inadequately recorded. In others, suitable record forms were available, but either their purpose was unappreciated by the staff, or their accuracy was not reviewed often enough to insure care in their keeping.

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In reviewing objectives with those responsible for local public health leadership, we found lack of knowledge, confusion and complacency muddled with earnestness and enthusiasm. An appreciation of the implications involved in a child hygiene program was lacking in many instances. Precept and practice were poles apart. Details of programs had so beclouded the main issue that the original conception was almost entirely lost sight of.

But let us be more specific! We found, in most of the centers, some interest in the possible relationship between indifferent obstetrics, an absence of prenatal and natal supervision, and the deaths occurring in the first month of life. This interest was purely academic in some; in others, it was manifested by the inclusion in the local program of time for prenatal visiting by the nursing staff, and in 2 centers municipally operated prenatal clinics were held. In none of centers concerned had the local authorities established intimate working relations with the medical profession of the community for the purpose of studying the best method of approaching this problem.

Increased hospitalization of maternity cases was apparently being encouraged in all communities, but whether this was part of an organized effort to influence maternal and infant deaths was not apparent. Forty-nine per cent of the births were in hospital. The death rate was apparently the same among these as among those born at home. It is interesting to note that of those women confined at home, 37 per cent were attended before, during, and after labor, by the Victorian Order of Nurses—an estimable organization, Dominion-wide in its scope, with branches in most of the large centers in Ontario—which offers bedside care to those unable to pay the ordinary fees demanded for such service. The standards of the service are high. The infant death rate, particularly in the first month, among those receiving this service was uniformly lower than for the city as a whole in every center in which they operated. Is this statistical fact the direct result of the contact between the nursing organization and the pregnant women? or the contact between the nursing organization and the attending physician? or both?

Despite the fact that prenatal supervision was a local objective, we could find records of only one-quarter of the pregnant women having been seen either by a physician or nurse before the onset of labor—not that I believe that only 25 per cent had prenatal care, but service rendered to the others was unrecorded. We were able to gauge the value of the prenatal service quantitatively only. Of those in which records were available, 29 per cent were seen during the first 6

months of pregnancy; 57 per cent were seen 3 or more times prior to delivery.

Appreciating, however, that an actual interest in the infant before it was born is a comparatively recent responsibility of health departments, we were inclined to be charitable in our criticism, and turned our attention to matters in which official interest was more actively demonstrable. We found that there was greater interest and less confusion in the minds of the municipal health staff when we discussed the subject in terms of infant deaths. The lessening of the infant mortality rate of this age group seemed to be the chief objective of most, and certainly was the yardstick by which all measured the success of their efforts. If it went down, whether justified or not, they took the credit; if it went up, the rise was either unexplained or was due to some cyclic epidemiological phenomenon not amenable to control.

In support of the efficiency of the local service, they told us how many children under 1 year attended the well baby clinics, and how often they came. This seemed to be the standard by which they desired their efforts to be measured. Nobody could tell us how many of the 8,428 infants born alive in the first 11 months of the year under survey, and who lived a month, were regularly under the care of the family physician or pediatrician. We ultimately uncovered the fact that about 17 per cent had been seen by a physician some time during their first year; whether it was to cure existing ills or prevent future ones, nobody knew. This was a definite weakness apparent in all the programs studied.

The local infant hygiene program was uniformly set in motion by what was known as a birth registration call by a member of the municipal nursing staff. The purpose of these introductory visits was vague in the minds of many of those making them. In many instances, they appeared to accomplish nothing more than a distribution of literature appropriate to the health needs of infancy, and a list of the municipally operated clinics. That the visits were made with faithfulness, however, is indicated by the fact that 76 per cent of these new arrivals were called upon. Our survey group was struck at this point with lost opportunity resulting from lack of appreciation by the nurse visitor as to the possibilities of this stage of the program.

In 5 of the cities only were medical men directly associated with the clinics carried on by the health departments. These were operated along orthodox lines, usually by physicians with a special interest in the field of child health. They received a small honorarium for their services in practically all centers. In the 6 cities in which there was

no medical attendant at the clinic, the gathering was described as a child health conference. The community nursing staff met the interested mothers at a given place, at a given time, and gave such advice as might possibly emanate from a nursing service. Irrespective of whether the gathering was a clinic or conference, the social or financial status of those attending had no bearing on their eligibility to be present—the socially prominent or socially obscure were equally welcome.

While clinic attendance was urged in every center, no uniform method of assuring its continuity was in effect; 49 per cent of those called on attended on at least 1 occasion, but only 53 per cent of those who came could be described as regular attendants. Adequate reasons for failure to return were hard to find. In some centers, there was the feeling that once they were made acquainted with the available facilities, the onus for failure to return was on the parents. In some, a home visit was paid following the first lapse in attendance; in others, one gathered that a modified clinic service was extended to those failing to attend regularly, through home visiting by the nursing staff. In 1 city only, had there been an attempt to analyze the reasons for failure to return. In the majority of centers the staffs seemed content to concentrate their efforts on those who were desirous of taking advantage of the service as offered and leave the balance to their own devices. Twenty-three per cent of all the children who lived over 1 month were regular clinic attendants.

Just what the clinic or conference offered those who came might very well be the subject of careful study—64 per cent of them were noted as having seen the clinic physician when the clinics were medically served. This did not mean that they had all been actually medically examined, however.

Group instruction was not attempted in any of the conferences. A child was weighed—if a degree of normal progress was maintained, apparently the mother was complimented; if failure to gain was noted, a casual inquiry was conducted. Few of the findings following this inquiry were ever recorded on the clinic form, however. Evidently the value of regular weighing as a gauge of physical progress was impressed upon the parents, and many on the advice of their private physician took their children to the center merely to have them weighed. Many of these gatherings had a social aspect: tea was served and the natural maternal pride in one's offspring was given an opportunity to manifest itself. The fact remains that many came and good must have resulted, but the extent of this good could not be measured. As was to be expected, the death rate among

the group of regular clinic attendants was lower than that for the municipality as a whole.

A review of the infant deaths was interesting, in that we found that of those stillborn, 49 per cent were delivered in hospital, and 39 per cent of these had had prenatal care; 49 per cent of those dying in the first month were born in hospital, and 47 per cent of these had had medical supervision during the period of pregnancy. Prematurity was described as the cause of death in 63 per cent of those dying during the first 24 hours, with congenital malformation the only other considerable cause of death. In those dying in the first week, prematurity was again responsible for the largest number of deaths, with cerebral hemorrhage second. Among those living over 1 week and dying within 1 month, prematurity is again noted as being responsible for a larger number of deaths than any other single cause. Gastrointestinal diseases constituted the chief cause of death in the group living 1 month but dying within the first year.

Breast feeding was practised in 58 per cent of all and in 36 per cent of those dying within the first year. Breast feeding was supplemented by artificial feeding in 21 per cent of all and in 39 per cent of those dying during the first year. Artificial feeding was practised only in 21 per cent of all and in 25 per cent of those dying during infancy. Pasteurization was the vogue in every municipality.

The economic status of the parents of the children dying in the first year was as follows: good, 28 per cent; fair, 31 per cent; and poor, 41 per cent. The intellectual status was estimated as follows: 29 per cent were fully alive to their responsibilities as regards the health of their children; 35 per cent seemingly were not as child-health-conscious as the first group, but were aware of the existence of the service offered by the local health departments. In 36 per cent, the mental attitude toward health was poor.

PRESCHOOL AGE

The local health program as it affected children between 1 and 5 years was, in all but 2 centers, an attempted extension of the clinic and conference service offered to infants; the success of which may be gauged by the fact that 51 per cent of those attending the clinics as infants continued for a period of at least 1 year as toddlers. The number of these still attending at 5 years of age was negligible, however. The number registered at the clinic after they were 1 year of age was larger in some centers than had been imagined. Thirty-five per cent of all attending were examined by the clinic physician in the cities in which physicians were attached to the service.

In but few of the centers was there a concerted effort being made to arouse the interest of parents in having the family physician regularly examine these children. Opportunities for immunization against diphtheria, smallpox, and, in one or two places, whooping cough, were extended by the clinic. In the 2 cities referred to above, the clinic service was supplemented by an organized attempt to have the children of 4 years of age annually examined by either the family physician, on forms supplied for this purpose, or by the medical staff of the local health department, aided by physicians temporarily employed.

SCHOOL AGE GROUP

Details as to the type and size of the various municipalities included in the survey have been deliberately left out of this report, but it is necessary to state that in Toronto, only a section of the city was studied—a representative district being chosen by the local Health Department. The study in Hamilton was not completed in time to include it in this presentation.

In 7 of the municipalities, the school health service is carried on under the auspices of the local school authorities; in 5, it is an activity of the health department. In 4 of the former there is no medical man directly associated with the work. It has been thought wise, therefore, to separate the findings in these communities from those of the 8 centers in which physicians are included in the program. They are labelled, Group 1, and Group 2.

It was found in Group 1 (comprising those cities in which the work had medical leadership) that 51 per cent of the children in attendance at school were examined by the school physician during the 2 years under review; 37 per cent of these were examined with 1 parent present. (In 2 of the cities, parents are not invited to attend at the time of the examination.) The attendance of parents in cities in which this practice was in effect reached 47 per cent. Of the children examined, 7,217, or 41.5 per cent had notifiable defects; 9,914 defects were recorded; 3,600 were labelled as in need of supervision. Twenty-nine per cent of those with defects had one or more of these corrected during the 2-year period; 34.5 per cent of which were corrected upon notification only; that is, the statement given the parent at the time of the examination by the examining physician, or the notification sent home with those unaccompanied by parents, was sufficient to influence the parent in securing treatment. Seventy-eight per cent of the children with defects were noted as having abnormal tonsils or adenoid overgrowth which warranted treatment, and 12 per cent had a loss of visual acuity sufficient to necessitate the

advice of an oculist. Fifty-two per cent of the total defects found were abnormal tonsils. Dental defects were not included in the study.

In the 2 cities in which the parents were not encouraged to attend at the time of examination, the percentage of corrections was slightly lower than the others in this group—namely 27 per cent, but 60 per cent of these were effected without any other effort on the part of the staff than the original notification.

Twenty per cent of the corrected defects were corrected within 3 months of their discovery, while in 45.5 per cent a year or more elapsed before correction was finally complete, the reason for delay being inability to pay immediately for treatment in more than 50 per cent of cases. In 51 per cent of those corrected within 3 months, the child had been accompanied by a parent at the time of examination.

Of the large number uncorrected at the end of the 2-year period, less than 30 per cent gave financial reasons as their excuse for not having treatment established, indifference, procrastination, parental objection, being the reasons advanced in more than 60 per cent of the cases in which a reason was noted. Defects of vision were most readily corrected—50 per cent of those found being corrected within the period under study while only 26.5 per cent of the nose and throat conditions were terminated by treatment in the same period.

The family physician or specialist of the family's choice was responsible for the treatment in 69 per cent, while only 31 per cent were treated by charitable agencies. The presence of hospital out-patient services did not materially raise the percentage of those treated in centers so equipped.

Efforts to stimulate correction among the tardy were almost solely confined to home visits by the nursing staff. There was no uniform practice as regards such visiting in effect in the municipalities concerned. In some, the minimum number of visits were paid; in others, few, if any, of those suffering from defects were left unvisited; 34.5 per cent were corrected without call; 23 per cent were called upon once; 36 per cent were visited 2 or more times; no accurate information could be obtained about the balance. Home visits to those uncorrected were as follows—33 per cent had 1 visit, 42 per cent had 2 or more visits, and 25 per cent were unvisited. Corrections were found to be as prevalent in the centers where home visiting was not the vogue as in those where it was intensively carried out. It was apparently a factor, however, in expediting treatment by charitable agencies in such cases as required this type of treatment.

School attendance was noted to be more irregular among those children suffering from defects to the extent of 4.2 days per year. In no center was repetition of a grade considered to be an indication of the need for medical inquiry. The data relevant to improvement in attendance and scholastic progress following the correction of defects was not convincing enough to justify its inclusion.

In the 4 municipalities where the service was entirely in the hands of nurses, a smaller percentage of the children attending school was examined during the 2 years in question, namely 37 per cent. The number of children with notifiable defects was higher than in Group 1, as was the percentage of corrections—55 per cent and 36 per cent respectively. Thirty-four per cent of the defects corrected were done with notification only. While 22 per cent of the children found with defects had below normal vision, only 65 per cent of the defects were associated with the nose or throat. Sixty per cent of the vision defects were corrected and 25 per cent of those with abnormal tonsils.

A higher percentage of the defects found were corrected within 3 months after notification, namely 29. The percentage taking over a year was exactly the same as in Group 1—45.5. The commonest reason for delay in correction was again inability to finance treatment, and among those uncorrected, the number of those giving financial reasons as their excuse for non-correction was much greater than in Group 1—indifference, procrastination, and parental opposition to treatment being less than half what it was in the centers medically served. The family physician was responsible for treatment in a larger percentage of cases in these centers than in those in Group 1.

In Group 2, home visits were paid to 36 per cent of those ultimately corrected; 27 per cent received 2 or more visits, and 34 per cent were corrected merely as the result of notification. Among those uncorrected, 22 per cent had 2 or more home visits paid to them, 33 per cent had 1 visit, 31 per cent had none, and the balance were unrecorded.

The school health staff measurably contributed to the control of communicable disease by urging immunization and interesting the teacher in the prompt exclusion of children showing evidence of such conditions as impetigo, scabies and pediculosis. The number of children suffering from the major communicable diseases actually found by them, either in the school or in the home, except where such disease had already reached epidemic proportions in the community, was negligible.

Health teaching, as such, was not well done by the school health staff. They undoubtedly have, in some instances, stimulated the interest of the teacher in a more adequate presentation of the subject.

CONCLUSIONS

1. Few of those actually engaged in the field of child hygiene are alive to the need for accurate and adequate recording.

2. In many instances, the purposes of the service have become vague, or have never been appreciated.

3. The relationship between the medical profession and the official health services is not as intimate as might be desired, having in mind our ultimate objective.

Further, there are certain observations which are statistically supported, but which before their final acceptance, warrant careful review by those actually charged with the responsibility for the conduct of a municipal child health service. It is with the hope that the results of this study may prompt such departments to become periodically introspective, that they are presented:

1. The problem of providing all pregnant women with the maximum of prenatal and postnatal care is still a long way from solution.

2. Prematurity is apparently the outstanding factor contributing to the high infant death rate in the first month.

3. The local staffs are bending too much of their effort toward increasing the attendance at the official operating clinic, instead of urging that all children receive regular supervision by the medical men of the community.

4. There is no satisfactory health program in operation which is appropriate to the needs of the preschool age group.

5. We were not able to demonstrate that the school health staff materially aided in the control of communicable disease.

6. The percentage of so-called major defects is predominatingly abnormalities of the tonsils.

7. The percentage of defects corrected is lower than it should be and the present time consuming method of stimulating corrections is limited in its effectiveness.

8. The presence of the parent at the time of examination can increase the interest of both parents and child in health supervision and the establishment of desirable health practices; it aids in arriving at a more accurate conclusion as to the need for treatment; but does not stimulate prompt correction to the extent previously imagined.

9. The percentage of parents who are sufficiently interested in the well-being of their children to require only an intimation that they are physically below par, is fairly constant in all municipalities.

10. Corrections in centers best supplied with free treatment facilities did not exceed those in centers not so equipped, to the extent formerly presumed.

11. Without belittling the value of medical leadership—it was not impossible to operate what appeared to be a comparatively satisfactory school health service by nurses working alone.

12. Here and there, was evidence of sufficient appreciation of objectives, clarity of thought, and originality of execution to encourage us in the belief that an acceptable, sound, and convincing program could be evolved and maintained.

The Addition of Vitamin D Concentrate to Milk*

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THE thought that milk should be the logical medium in which to offer " vitamin D " to infants and children is by no means new. Almost immediately after it had been clearly demonstrated that certain ultra-violet wave-lengths can confer antirachitic properties on food substances, attempts were made in Germany to put this idea into practice. The chief early obstacles in the way of successful activation of milk were the effect on taste and other properties, and the fear of toxic effects. Of late the irradiation of milk has met with a certain amount of success in some German cities. Cost has always been a consideration. The difficulties have apparently been successfully met in the work reported by Dr. George C. Supplee.

During the past years we have been engaged in the further purification and improvement of the antirachitic concentrate from cod liver oil on which we first reported in 1921; and we have recently perfected preparations of higher potency and purity which, when incorporated in milk, will not affect its taste.

For the purposes of study on a practical scale, one dairy has now been licensed to prepare such milk. The concentrate is furnished to the dairy as a " 150 D " preparation, i.e., a preparation which by line test is 150 times as strong as the standard cod liver oil according to the Steenbock line test method. This concentrate, when diluted 1 to 12,000 in milk, will give a milk which contains approximately 150 units of " vitamin D " per quart, or the equivalent of 3 teaspoonfuls of cod liver oil. The preparations furnished to the dairy are carefully standardized and assayed. The incorporation can be done either by homogenization, by partial homogenization, or by another method without homogenization. By none of these methods is there any separation of the concentrate from the cream. In the non-homogenized milk the fat globules are of the same range of size as in

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ordinary milk. The highly potent concentrate as now produced from cod liver oil is diluted down to 150 D for two reasons: to have it in conveniently dilute form for measurement, and to avoid even the remotest possibility of accidental overdosage.

The milk produced in this manner has been frequently assayed on rats for antirachitic potency and has never been found wanting. This should be so, since the concentrate is standardized and the manner of incorporating is of the simplest kind. Studies have also been made of its antirachitic effect on infants. In children receiving about 100 to 150 units daily in milk, effects recorded in the healing of rachitic bones were the same as have been frequently shown with 3 teaspoonfuls daily of cod liver oil. Both X-rays and blood phosphorus showed a return toward normal in about 2 weeks, and cases of complete healing as judged by X-ray were recorded in about 40 days.*

The " vitamin D " milk made by the addition of a concentrate has certain characteristics which may distinguish it from other " vitamin D " milks.

1. It contains the " natural vitamin D," i.e. the same antirachitic substance we have always dealt with in cod liver oil. Steenbock [1] has recently presented evidence that the product made by artificial irradiation of sterols is not the same active substance as that occurring naturally in cod liver oil.

2. The rat assay data can be directly applied to human needs, avoiding the confusion and uncertainty we encounter in irradiated products. This is important, since all methods of standardization so far proposed involve the assay by means of rats.

3. The preparation of the milk is of the simplest kind, necessitating no extra equipment and not depending on special controlled feeding of cows. The chance of error is minimal, since only a simple measurement of a standardized, previously assayed concentrate is involved.

4. The price of the milk will, to begin with, be distinctly less than the price of ordinary milk plus the price of an equivalent amount of an average good cod liver oil. One dairy has been licensed to produce this milk, and the figures for cost are actual cost to consumer including all marketing and assay costs.

These facts are presented, not so much with a view to showing any relative superiority of one " vitamin D " milk over another, but rather for the consideration of the conditions under which one or the other milk may become a practical project.

If public health measures are to be instituted by means of " vitamin D " milk, a number of questions must receive careful consideration.

1. Can a milk of sufficiently constant potency be produced regularly in a dairy? The simplicity of the process involved in the incorporation of the concentrate in milk gives us relatively high assurance that errors can be avoided.

* These studies were made on 15 rachitic infants by Dr. Donald J. Barnes at the Children's Hospital in Detroit (in press).

Assays have been carried out on a considerable number of samples made under actual production conditions. These have uniformly shown the required number of units.

2. What is the most practical number of units of "vitamin D" per quart? We tentatively suggest 150 units per quart since this corresponds to the generally accepted dose of 3 teaspoonfuls of cod liver oil for any except very young infants, who would automatically receive smaller amounts in proportion to food intake. However, the number of units per quart can be so easily adjusted that any demand for other levels can be very readily met, if necessary, even by prescription.

3. Is there any danger either to the consumer's health or otherwise in putting this "vitamin D" milk on the market? Since we are dealing with the same antirachitic principle as has been used for many years in cod liver oil, there is no reason to believe that 150 units is either too high or too low. The effectiveness of the concentrate in various species (rat, chicken and man) is entirely parallel to that of cod liver oil. The small amount of cotton seed oil used as a solvent, diluted in the milk in the ratio of 1 to 12,000, is of no consequence. The question has been raised whether the introduction of "vitamin D" milk will discourage breast feeding, but there seems to be no very positive opinion one way or another. The possibility of encouraging self-medication is no more serious than that involved in the spread of knowledge concerning the beneficial effects of sunlight.

4. What does the project involve from the standpoint of enforcement agencies? The question has been raised whether the introduction of "vitamin D" milk will not put an undue burden on the officials entrusted with the enforcement of pure food laws or necessitate the establishment of large numbers of laboratories for biological assays. A cursory survey shows that in many states there are laboratories in state institutions (state university, agricultural college or experiment station) which are carrying on work of this type, and that such laboratories are increasing in number. There should be no difficulty in selecting in each state one institution to carry on the biological assays. To such designated laboratory the enforcement officials could forward the samples as taken up and receive a report in 12 to 14 days. The cost of these assays when done regularly and in suitable numbers is not as high as is commonly thought, and could be easily defrayed by the milk organization or the producer of concentrate without any significant increase to the consumer. As far as the pure food laws and the addition of foreign material to milk are concerned we should not rely on precedent such as acidophilus milk or chocolate milk but should allow this "vitamin D" milk to stand on its own merits. If it is not a useful project it should be rejected; if it is useful, the laws can be amended. In the meantime, wherever necessary, temporary permits such as are often granted will allow a thorough trial to be made as to usefulness and practicability.

REFERENCE

1. Steenbock. *J. Biol. Chem.*, July, 1932.

NOTE: A plan of state supervision including biological assays at the State Agricultural College has in the meantime been put into effect in Michigan.

Nutritive Value of Cranberries*

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AMONG the fruits, the cranberry is unique in several ways. It is among the last of the fruits to mature before winter, and because of its good keeping qualities is the only fresh berry available during the autumn and early winter. Normally the cranberry is consumed only after cooking. Cooked cranberries form a firm sauce or jelly with 40–45 per cent of sugar, whereas other fruits require from 65–70 per cent. The flavor and chemical composition also serve to differentiate the cranberry from other fruits.

The cultivated cranberry (*Vaccinium macrocarpum*) is grown principally in four areas in the United States: Massachusetts, New Jersey, Wisconsin, and Oregon-Washington. Of the annual crop of about 500,000 barrels or 50,000,000 pounds, Massachusetts produces about 65 per cent. The annual per capita consumption is approximately 0.54 lb. The active marketing season extends from September 10 to January 1, though cranberries are often available throughout the winter months. Approximately 65 per cent of the crop is sold through the American Cranberry Exchange—an outstanding example of a successful coöperative.

The cranberry grows in low-lying moist bogs or marshes and requires special soils and cultural treatment for successful growth. In Massachusetts there are about 14,000 acres of cranberries, the yield per acre averaging close to 25 bbls. The retail selling price is variable and depends upon the total production, but a fair average is 12 cents a quart (approximately 1 lb.). Though there are probably 50 varieties of cultivated cranberries, only a few are commercially important, among these being Howes and Early Black.

PROXIMATE ANALYSIS

The cranberry contains about 11.5 per cent dry matter of the composition shown in Table I.

Food Constituents of Cranberries—The sugars are relatively low, the acids high. According to Nelson [1] about 88 per cent of the fixed

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acids are citric, the rest malic. Our data show a benzoic acid content of 0.035 to 0.095 per cent in 10 varieties—amounts that exert considerable preserving action on both the fresh fruit and manufactured products. Experience has shown that after filling the cans or jars with hot cranberry sauce, no further heat treatment is necessary.

TABLE I

COMPOSITION OF CRANBERRIES

	Per cent
Reducing sugars	4.2
Acids (citric, malic and benzoic)	2.4
Pectin	0.65
Fat and wax	0.4
Protein	0.4
Ash	0.25
Fiber, tannin and undetermined	3.2
Total dry matter	11.5

Quinic acid, or a substance yielding quinic acid, is present to the extent of 0.6–0.9 per cent. This value was obtained indirectly by determining the total hippuric acid in the urine of young men on diets containing known amounts of cranberries. The benzoic acid in the berries was insufficient to account for the amount of hippuric obtained, hence the difference was assumed to be due to quinic acid. Recently Morse [2] has checked these results by more direct analytical methods. Great controversy has raged over the alleged harmful effects of small amounts of benzoates upon human health. In view of the simple method of elimination of benzoic acid from the body—conjugation with glycine to form hippuric acid, which is voided in the urine—the preponderance of scientific opinion, and our findings on young men fed up to 300 gm. of cranberries daily, support the view of the relative harmlessness of cranberries so far as their benzoic acid content goes. However, the recently discovered quinic acid is present in much larger quantities and, as Quick [3] has proved, is transformed first to benzoic and finally to hippuric in a manner analogous to benzoic acid itself. The elimination of quinic acid from the body though slower, is usually complete in 12 hours. Blatherwick [4] found that large doses of both prunes and cranberries increased the organic acids of the urine. Prunes produced twice as much hippuric acid as cranberries. The dose of cranberries fed was 300 gm., equivalent to almost 2 lb. of cranberry sauce.

Our data bearing on the effect of cranberries on urinary acidity and the blood alkali reserve are presented in Table II.

The hippuric acid in the urine is practically proportionate to the

TABLE II

EFFECT OF CRANBERRIES ON HIPPURIC ACID IN THE URINE AND THE BLOOD PLASMA ALKALI RESERVE

Wt. of Cranberries Fed Grams	*Equiv. Wt. of Cranberry Sauce Oz. Avoir.*	*No. of Subjects*	*Decrease pH Urine*	*Hippuric Acid Mgs. in 100 c.c. of Urine Increase Over Normal*	*Alkali Reserve c.c. of CO_2 per 100 c.c. plasma Decrease from Normal*
22.0	2.0	4	+.06	0.1	+0.9
32.7	3.0	2	.00	0.53	+0.8
54.0	5.0	2	.08	0.32	+3.5
100.0	9.2	2	.16	0.76	14.7
150.0	14.0	2	.21	1.68	23.0
200.0	18.6	2	.23	2.15	33.1
250.0	23.2	4	.35	2.48	40.8
300.0	27.5	2	.42	3.60	46.5

weight of cranberries eaten though small doses affect the acidity very little. Similarly the pH of the urine was affected appreciably only after the administration of rather large quantities of cranberries.

The alkali reserve showed no decrease until more than 54 gm. of cranberries, equivalent to 5 oz. of cranberry sauce, had been eaten. Thus, usual, or even liberal servings of this sauce, do not appreciably affect the body's alkali reserve. The buffer action of the blood probably accounts for this protective action. Very large doses do produce significant transitory decreases in the blood alkali reserve.

Apparently the citric and malic acids present in cranberries are fully oxidized.

Other Constituents—Pectin is present in considerable quantity and is the constituent responsible for the high jellying power of cranberry sauce. The fruit must be cooked with boiling water to extract the pectin. Unlike other fruits the pulp or juice forms a firm jelly at a sugar content of 40–45 per cent.

TABLE III

NUTRITIVE PROPERTIES OF CRANBERRY SAUCE

Constituent	*Mg. per 4-oz. serving*	*Constituent*	*Mg. per 4-oz. serving*
Reducing sugars	48,590.0	Copper oxide (CuO)	0.4
Fruit acids (as citric)	916.0	Phosphorus pentoxide (P_2O_5)	9.8
Protein	172.0	Sulfur trioxide (SO_3)	5.3
Fat and wax	160.0	Chlorine (Cl)	1.7
Total ash constituents	107.0	Iodine (I)	0.002
Fiber (whole fruit sauce)	3,600.0	Vitamin A	+
Potassium oxide (K_2O)	33.0	Vitamin B	—
Sodium oxide (Na_2O)	3.4	Vitamin C	++
Calcium oxide (CaO)	10.7	Vitamin D	—
Magnesium oxide (MgO)	4.7		
Iron oxide (Fe_2O_3)	1.8	Calories per 4 oz. serving	200.0
Manganese oxide (Mn_3O_4)	0.3	Alkalinity of the ash	2.2

The wax is present largely on the skins and acts to protect the fruit from water, insects and fungi. The protein content is low, about 0.4. The fiber, consisting largely of skins and seeds, is not objectionable in whole fruit sauce, and aids in elimination. The cranberry itself is mildly laxative.

The ash content is relatively low, but its reaction is definitely alkaline, in several varieties averaging 2.2. In spite of this some writers have stated that " prunes, plums and cranberries " are exceptions to the fruits that leave alkaline residues after digestion.

Table III shows the principal ash and other constituents as calculated from our analyses. Since the berries are seldom eaten raw, the figures are given in terms of a normal serving of cranberry sauce—1 lb. of cranberries yields approximately 2.6 lb. of sauce.

The ash constituents are largely potassium, calcium and phosphorus. Morse,[5] and McClendon [6] have determined the iodine content, which ranges from 26 to 138 parts per billion. This is relatively high for fruits and vegetables, and cranberries thus approach some marine foods in iodine content. The manganese content is likewise significantly high.

VITAMINS OF CRANBERRIES

The writer in collaboration with Isham has just completed a vitamin survey of cranberries. Only a summary of the results can be given here.

Using the Sherman, LaMer and Campbell [7] technic, we found the vitamin C content of fresh cranberries in 1930 and 1931 to be relatively high—from 3 to 4 gm. daily sufficing to maintain normal growth and afford full protection from scurvy in 300 gm. guinea pigs. There

TABLE IV

VITAMIN C CONTENT OF CRANBERRIES

Form of Cranberry	*No. of Guinea Pigs*	*Quantity Fed Grams*	*Gain in Wt. Av. 90 Days*	*Survival Period Av. Days*	*Scurvy Score Av.*
Early Black	5	3	182	90	1–2
" "	5	5	134	90	0
" "	5	10	153	90	0
Howes	3	1	—58	42	12
"	3	2	4	90	7
"		4	123	90	0
Frozen Howes (9 mos.)	4	4	165	90	0–1
" " "	4	5	246	90	0
Howes (40° for 3 mos.)	5	4	218	90	0
" (40° for 7 mos.)	6	5	130	90	6
" (40° for 9 mos.)	3	10	176	90	2
Howes (juice boiled 2 min.)	6	4	190	90	0
" (" bottled pasteurized)	5	8	—169	49	10

TABLE V

VITAMIN C CONTENT OF CRANBERRY PRODUCTS

Form of Cranberry	*No. of Guinea Pigs*	*Quantity Fed Daily Grams*	*Fresh Cranberry Equiv. Wt. Grams*	*Gain in Wt. Av. Grams*	*Survival Period Av. Days*	*Scurvy Scored Av.*
Whole fruit sauce	9	10	4	83	90	4
" " "	3	14	5.4	279	90	0
Strained sauce	6	20	8	—30	54	11
" " (canned)	9	20	8	—59	45	15
Whole-fruit sauce (canned)	6	12	4.6	—60	65	5
Evaporated whole	3	2	16	—120	37	16
Film or powder (Quick-dried)	3	2	16	164	90	0
" "	3	1	8	3	90	4

was no varietal difference. The fresh fruit when stored for 3 months at 40° F. showed very little loss of vitamin C. Freezing and subsequent storage at 0° F. for 9 months did not affect the vitamin C content. However, alternate freezing and thawing had a very destructive effect. Evaporated whole cranberries contained no measurable amount of vitamin C, but a quick-dried powder or film retained over 50 per cent of the original C content. Cranberry juice is becoming a popular beverage. The fresh juice is fully as potent as the fruit, but after extraction, bottling, and processing, little of the vitamin C is retained by the methods now in use.

Whole-fruit cranberry sauce as usually prepared contains approximately 80 per cent of the original vitamin C content, but strained sauce retains less than 10 per cent.

Vitamins B and D were absent or present in such small quantities as to be insignificant. Vitamin G was present in traces only. Vitamin A was present in small but measurable amount—1.2 units per gm. This was sufficient to cure xerophthalmia in rats and produce normal growth.

SUMMARY

Aside from its esthetic values of eye and taste appeal, the cranberry is valuable in the diet chiefly for its high vitamin C, iodine, and energy values. The ash is slightly basic and contains significant amounts of potassium, phosphorus, manganese, and iron.

The benzoic acid content of fresh cranberries varies from 0.035 to 0.095 per cent and quinic acid from 0.6 to 0.9 per cent.

Moderate, or even generous servings of cranberry sauce do not lower the blood alkali reserve but very large quantities decrease it significantly.

The conjugation of benzoic and quinic acids in the body produce urinary acidities in proportion to the amounts of cranberry ingested, though servings of 5 oz. or less of cranberry sauce produce little change in either pH or hippuric acid values.

Fresh and frozen cranberries and whole-fruit jellied sauce are excellent sources of vitamin C and contain significant amounts of vitamin A as well. Vitamins B, D, and G are not present in significant amounts.

The cranberry possesses considerable merit as a food and when eaten in normal quantities its wider use in the diet can be recommended.

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Industrial Medicine

A NEW illustrated journal of professional, scientific and public health interest, entitled "Industrial Medicine," made its appearance with Volume I, No. 1, October, 1932. It is devoted to the industrial interrelations of medicine, law, insurance, and economics, and aims at the cumulative study of these.

The journal contains articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussions and on this basis contributions are invited.

Issue No. 2, November, 1932, contains 75 pages. We note that 12 pages were devoted in this issue to a synopsis of pertinent papers presented at the Washington Meeting of the American Public Health Association.

Publication office—844 Rush St., Chicago, Ann. sub. $5.00. E. R. H.

Laboratory Diagnosis of Endemic Typhus and Rocky Mountain Spotted Fever*

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THERE is widely scattered throughout the world a rather large group of diseases commonly referred to as the typhus-like group of fevers. The members of this group have many characteristics in common and are characterized in man by a sudden onset, chills, fever, severe headache, various degrees of prostration, mental symptoms, arthralgias and myalgias, and an exanthem. The viruses of several have been shown to produce agglutinins to *B. proteus* X_{19}. An insect vector has been incriminated epidemiologically in all and proved in some. Two members of this group, endemic typhus and Rocky Mountain spotted fever, occur endemically in the United States and the discussion in this paper will be confined to these.

The experimental animals routinely used are the guinea pig, rabbit, and monkey, and the materials routinely employed in making inoculations are whole blood in spotted fever and whole blood and testicular washings in endemic typhus. Other materials may be used but those mentioned have been proved the most satisfactory.

The identification of a virus of endemic typhus or of spotted fever is based on the fulfilment of the following criteria: The clinical manifestations and pathological anatomy produced in animals by the unknown virus must be similar to those produced by the known virus; the production in the sera of rabbits and monkeys of agglutinins to *B. proteus* X_{19}; the production of a definite and complete cross-immunity between the unknown virus and the known virus. Cultures of the cardiac blood of animals from which inoculations are made should be negative.

THE DIAGNOSIS OF A VIRUS OF ENDEMIC TYPHUS

Clinical Manifestations and Pathological Anatomy—In the female guinea pig the only clinical manifestation is fever, while in the male

* Read before the Laboratory Section of the American Public Health Association at the Sixty-first Annual Meeting in Washington, D. C., October 25, 1932.

an involvement of the external genitalia in addition to fever is the rule. The onset is abrupt after an incubation period varying with the material employed in making the inoculations. Generally the period of incubation is from 2 to 4 days following intraperitoneal inoculations with testicular washings, and from 6 to 10 days with blood or emulsion of brain tissue. The febrile response is irregular with a maximum temperature varying from 40.0° to 40.5° C. and a duration averaging from 6 to 7 days.

The most characteristic clinical sign of endemic typhus in the guinea pig is the involvement of the male external genitalia. This usually appears with the onset of fever, although it may appear a day or two before or after. The involvement is characterized by a diffuse erythema and edema of the scrotum, which may become markedly swollen and tense, and by an enlargement of the testicles which when well developed prevents them from being forced into the abdominal cavity. This condition gradually subsides and the tissues return to normal.

Macroscopically the appearance of the abdominal organs varies with the stage of the disease. For the first few days after onset the spleen is normal in appearance, while later it may be slightly enlarged and darker than normal with prominent Malpighian bodies. In the first day or two the testicles are swollen and the surrounding tissues are edematous with the vessels engorged. There is seen early a thin layer of exudate over the testicles. Hemorrhages may appear in the tissues, particularly at the poles. Later the tunica is thickened and adhesions develop.

Histological examination of sections of the brains of guinea pigs which have reacted to the virus reveals the vascular and nodal lesions seen in epidemic (louse-borne) typhus. These lesions, although less frequent than seen in some strains of epidemic typhus, have been found in approximately 25 to 60 per cent of the male * guinea pigs examined. The percentages have varied with the different strains of virus studied.

The clinical manifestations in the rabbit are indefinite. In a series of 69 male rabbits, 33 at no time had any evidence of fever, 15 had fever for 1 day, 6 for 2 days, and 1 had a fever lasting 3 days. None of the 69 showed any involvement of the external genitalia.

Monkeys react clinically with fever only. Eleven of a series of 13 monkeys responded to inoculation with a definite febrile reaction following periods of incubation of 1 to 4 days, with maximum temperatures of 40.0° C. to 41.3° C., the duration of the febrile periods

* Only male guinea pigs employed.

varying from 3 to 11 days. None of the monkeys showed evidence of an exanthem.

The mortality is nil in laboratory animals reacting to inoculations with an endemic typhus virus uncomplicated by secondary invaders.

The Weil-Felix Reaction—As a rule, the virus of endemic typhus produces agglutinins to *B. proteus* X_{19} in the sera of rabbits and monkeys. In a series of 69 rabbits the sera of 52, or 75.3 per cent, gave complete agglutination (4+) in the titer of 1:80 or higher, and 32, or 46.3 per cent, in the titer of 1:160 or higher. The highest titer in which complete agglutination occurred was 1:640. The readings were made once weekly after inoculation and the maximum readings obtained with 7 on the 7th day; 46, or 66.6 per cent, on the 14th day; 14 on the 21st day; and 2 on the 28th day.

Of the 11 monkeys which reacted clinically, the sera of 8, or 72.7 per cent, gave complete agglutination in the titer of 1:80 or higher, and 6, or 54.5 per cent, in the titer of 1:160 or higher. The highest titer in which complete agglutination occurred was 1:640. The maximum readings were obtained from the 10th to the 20th day after the onset of symptoms with but 2 after the 14th day. All maximum readings were obtained after the temperature had returned to normal.

Cross Immunity—The guinea pig is the most satisfactory animal with which to carry out cross-immunity tests. Before one can state definitely whether or not an unknown strain of virus is one of endemic typhus, animals immune to the unknown must be tested with a virus of endemic typhus, as well as animals immune to the endemic typhus virus tested with the unknown.

Rickettsia—Rickettsiae are found in the tissues of the guinea pigs reacting to the virus of endemic typhus and in stained smears made with scrapings of the tunica.

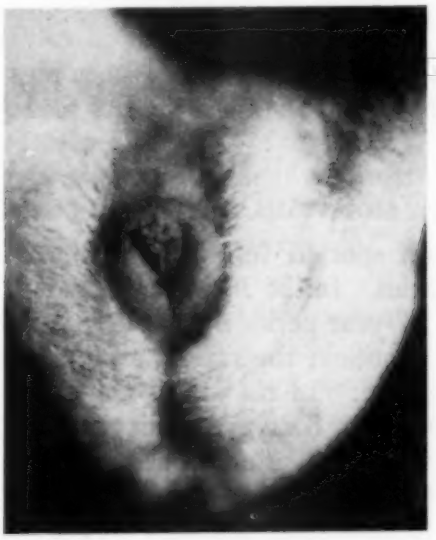
THE DIAGNOSIS OF A VIRUS OF ROCKY MOUNTAIN SPOTTED FEVER

The virulence of Rocky Mountain spotted fever in the northwestern states varies in different localities. In the Bitter Root Valley of Montana the mortality rate in the 12-year period, 1917–1928, was 76.8 per cent. In other sections of Montana the rate is around 30 per cent, and in Idaho around 5 per cent. In the states along the Atlantic Coast it has been from 20 to 25 per cent, resembling that in sections of Montana outside of the Bitter Root Valley. The difference in the virulence of the disease in the East and that in the Bitter Root Valley, noted in man, is also evident in laboratory animals. There is noted also a difference in the clinical manifestations in the guinea pig resulting from inoculations with the western virulent virus and the

eastern viruses studied, and which originated both from human cases and ticks infected in nature.

Clinical Manifestations and Pathological Anatomy—The febrile reaction in the guinea pig resulting from inoculations with the virus of the eastern type and of the western virulent type are essentially the same; however, there is a tendency for the incubation period to be shorter and the maximum temperature to be higher with the western virulent virus. Generally the period of incubation is from 1 to 4 days and the duration of the febrile period from 7 to 10 days with the maximum temperature from 40.5° to 41.5° C.

In the male guinea pig reacting to the western virulent virus involvement of the external genitalia is the rule, while such involvement is rare following inoculations with the eastern virus. Two strains of the eastern virus originating from human cases, and 1 originating from ticks infected in nature, have been studied in the male guinea pig. Involvement of the external genitalia has occurred only occasionally and attempts to transmit the involvement to subsequent generations have failed. This genital involvement is characterized clinically by erythema and swelling of the tissues of the scrotum. In a light colored animal the onset of the scrotal involvement has been noted as small reddish macules which become confluent and later hemorrhagic. Ulceration of the scrotum often occurs. If the guinea pig recovers the swelling subsides, the ulcers heal, and the tissues return to normal.



PHOTOGRAPH I—The appearance of the scrotum of a normal guinea pig

PHOTOGRAPH II—Scrotum of a guinea pig reacting to an intraperitoneal inoculation of a strain of *S. enteritidis*

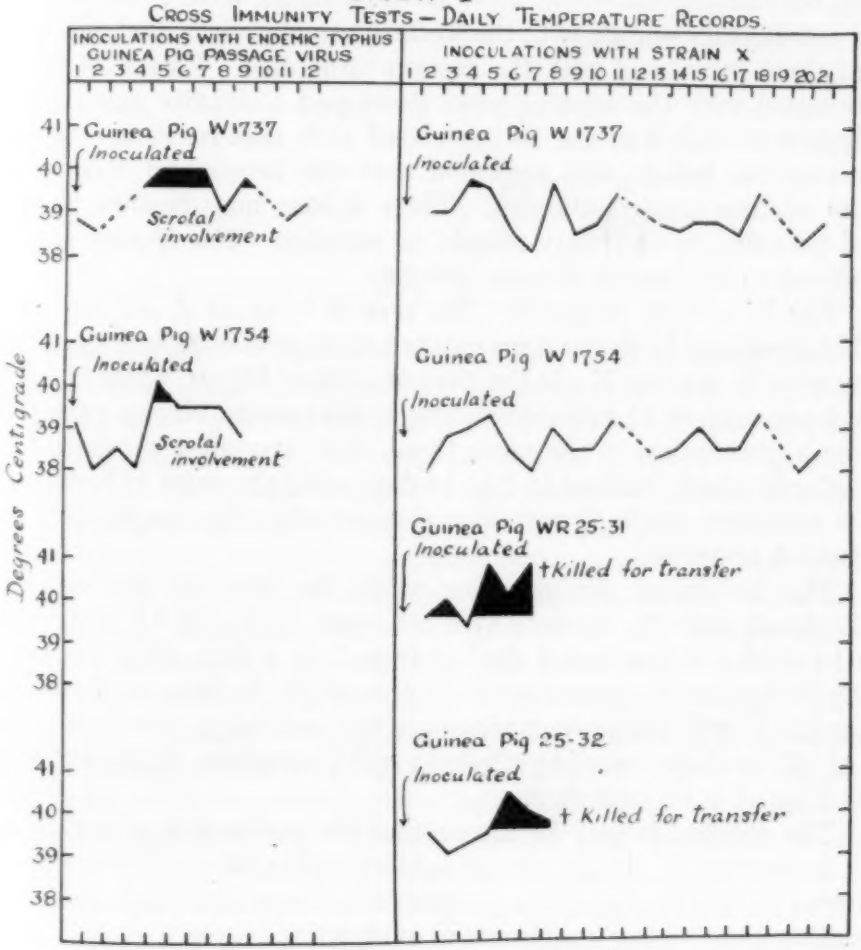
The mortality rate in the guinea pig infected with the western virulent type is approximately 90 per cent, and that of the eastern type approximately 60 per cent.

On post-mortem examination during the early days of the disease the spleen is, as a rule, markedly enlarged, 3 to 5 times its normal size, smooth and darker than normal. With the viruses of the eastern type studied the testicles are normal, while with the western virulent virus they are enlarged and the surrounding tissues edematous. Later in the disease exudate may appear on the testicles and adhesions may form.

Histological examination of sections of brains of guinea pigs which have reacted to either the western virulent or the eastern virus reveals the presence of nodal and vascular lesions like those seen in typhus.

CHART I

CROSS IMMUNITY TESTS — DAILY TEMPERATURE RECORDS.



In the clinical manifestations in the rabbit there has been no difference noted between the western virulent and the eastern viruses. After an incubation period of 2 to 7 days, the rabbit becomes febrile, the febrile period varying from 4 to 10 days with a maximum temperature of 40.0° to 41.0° C. In the male there may occur an involvement of the external genitalia characterized by erythema and edema of the tissues of the scrotum and enlargement of the testicles. Ulceration of the scrotum may occur.

The apparent difference in virulence between the western virulent and the eastern virus is also noted in the monkey. Thirteen of 16 monkeys inoculated with the eastern virus reacted after periods of incubation of 3 to 8 days, while each of 15 monkeys inoculated with the western virulent virus reacted after periods of incubation of 1 to 3 days. The maximum temperature varied from 40.0° to 41.4° C. with the former, and 40.8° to 41.6° C. with the latter. All but 1 of the monkeys inoculated with the western virulent virus died, while but 2 of those inoculated with the eastern virus died. Eleven of the 15 inoculated with the western virus developed a definite exanthem in comparison with 8 of the 16 inoculated with eastern virus. In each instance the lesions first appeared over the brows and face in the form of rose colored macules. These lesions may become papular and purpuric or they may remain as macules. The lesions may be confined to the face or become general.

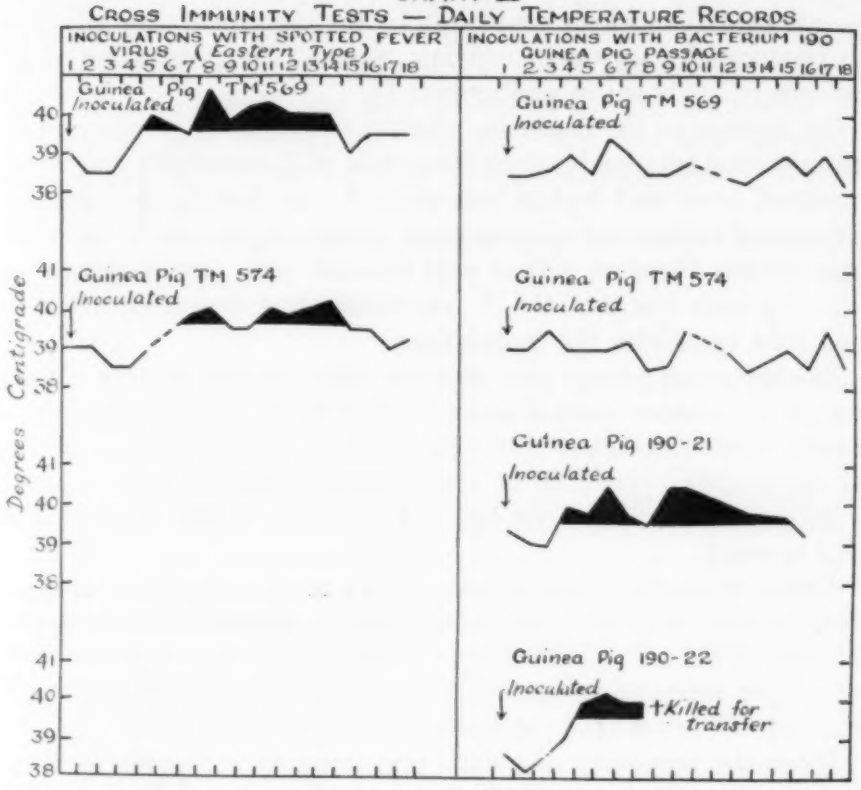
The Weil-Felix Reaction—The sera of 6, or 75.0 per cent, of 8 rabbits reacting to the western virulent virus gave complete agglutination with *B. proteus* X_{19} in the titer of 1:80 or higher, while but 4, or 26.6 per cent, of 15 rabbits reacting to the eastern viruses gave complete agglutination in the same titer. The maximum readings were obtained in each instance in 7 to 14 days after the onset of symptoms. The maximum readings were also obtained after the temperature had returned to normal.

The maximum agglutination with the sera of the monkeys inoculated with the western virulent virus could not be determined as 14 of the 15 inoculated died in from 3 to 8 days after the onset. The production of agglutinins for *B. proteus* X_{19} in the sera of monkeys inoculated with the eastern viruses is not constant. The sera of but 5 of 13 monkeys reacting clinically gave complete agglutination in the titer of 1:80 or higher.

The conclusion may be drawn that the production of agglutinins for *B. proteus* X_{19} in the sera of rabbits and monkeys reacting to the viruses of Rocky Mountain spotted fever is not constant but when positive gives strong confirmatory evidence.

CHART II

CROSS IMMUNITY TESTS — DAILY TEMPERATURE RECORDS


INOCULATIONS WITH SPOTTED FEVER VIRUS (Eastern Type)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
INOCULATIONS WITH BACTERIUM 190 GUINEA PIG PASSAGE
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Guinea Pig TM 569
Inoculated
Guinea Pig TM 574
Inoculated
Guinea Pig 190-21
Inoculated
Guinea Pig 190-22
Inoculated
†Killed for transfer
Degrees Centigrade
40
39
38
41

Cross Immunity—The procedures necessary to determine the immunological relation between an unknown strain of virus and a known strain of spotted fever virus are the same as those discussed in the diagnosis of a strain of endemic typhus virus.

Infections frequently occur spontaneously in guinea pigs and epizootics occurring among stock animals are not rare.

In undertaking to identify an unknown strain of virus suspected of being either typhus or spotted fever it must be borne in mind that known organisms may produce symptoms in laboratory animals, especially in the guinea pig, which cannot be distinguished clinically from those produced by these viruses. It has been found that clinical reactions produced by such organisms are particularly confusing when dealing with a virus, such as that of eastern spotted fever, which produces fever as the only clinical manifestation. Findings which could not be distinguished, either clinically or by the appearance of the abdominal organs, from those caused by the eastern type of spotted fever virus have been produced in guinea pigs by inoculation with a strain of *S. enteritidis*. To add to the confusion, this same organism

has produced occasionally in the guinea pig involvement of the external genitalia, which could not be distinguished clinically from that produced by a virus of endemic typhus. An illustration of this involvement is shown in photograph II.

On account of the confusing clinical reactions in guinea pigs the immunological relation between this strain of *S. enteritidis* and viruses of spotted fever and typhus was studied. In testing the immunity of recovered typhus and spotted fever guinea pigs to the *S. enteritidis* whole cardiac blood of guinea pigs infected with this organism was used. In each instance the *S. enteritidis* was recovered from the blood used in making the inoculations.

Twenty-seven guinea pigs immune either to the western virulent virus or the eastern spotted fever virus, with 49 fresh guinea pigs as controls, were inoculated with this strain of *S. enteritidis*. Seventy and three-tenths per cent of the immune animals failed to react (apparently immune), while but 8.1 per cent of the fresh controls failed to react.

Thirty-two guinea pigs, immune either to the endemic or epidemic typhus viruses, with 45 fresh guinea pigs as controls, were inoculated with this strain of *S. enteritidis*. Thirty-seven and five-tenths per cent of the immune animals failed to react (apparently immune), while but 6.3 per cent of the fresh controls failed to react.

When the immunity of guinea pigs immune to *S. enteritidis* was tested to the viruses of spotted fever and typhus different results were obtained.

Nineteen guinea pigs immune to *S. enteritidis,* with 32 fresh guinea pigs as controls, were inoculated with viruses of spotted fever. Ten and five-tenths per cent of the immune animals failed to react, while none of the fresh controls failed to react.

Seven guinea pigs immune to *S. enteritidis,* with 14 fresh guinea pigs as controls, were inoculated with typhus viruses. None of the animals failed to react.

Illustrations of this non-specific immunity are shown in Charts I and II.

Chart I—The male guinea pigs W 1737 and W 1754 were first inoculated with the virus of endemic typhus to which inoculations they reacted with fever and the characteristic scrotal involvement. They were later tested for immunity to the *S. enteritidis* (strain X). This immunity test was controlled by the inoculation of 2 fresh guinea pigs, WR 25–31 and WR 25–32. The 2 immune endemic typhus animals failed to react (apparently immune), while the control animals reacted.

Chart II—The guinea pigs TM 569 and TM 574 were first inoculated with the virus of spotted fever (eastern type) to which inoculations they responded with the characteristic febrile reaction. They were later tested for immunity to the *S. enteritidis* (Bacterium 190). This immunity test was controlled by the inoculation of 2 fresh guinea pigs, 190–21 and 190–22. The two immune spotted fever guinea pigs failed to react (apparently immune), while the control animals reacted.

In the charts the shaded portions represent fever, temperature over 39.6° C.

SUMMARY

There are certain and definite criteria for the identification of an unknown strain of virus as being one of endemic typhus or spotted fever.

With the exception of the involvement of the external genitalia of the male guinea pig the clinical symptoms produced in laboratory animals by the virus of endemic typhus exhibit nothing characteristic of the disease. In the male guinea pig the western virulent virus of spotted fever produces a characteristic involvement of the external genitalia, while the viruses of the eastern spotted fever studied produce no symptoms in the guinea pig which are not produced by some known bacteria. Both the western virulent virus and the eastern virus of spotted fever may produce in the rabbit the characteristic involvement of the external genitalia and in the monkey the characteristic exanthem.

The viruses of spotted fever, as well as the virus of endemic typhus, produce in the brain of the guinea pig the nodal and vascular lesions seen in European louse-borne typhus.

The Weil-Felix reaction has been found positive with approximately 75 per cent of the sera of rabbits and monkeys inoculated with either the endemic typhus virus or the western virulent spotted fever virus. The Weil-Felix reaction has been found positive with but approximately 25 per cent of the sera of monkeys inoculated with the eastern spotted fever virus.

Immunity tests must be clean-cut and made in both directions.

Cultures of the cardiac blood of animals from which transfers are made must be consistently negative, as confusing clinical symptoms and immunity tests have been caused by known bacteria.

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Cultures of the cardiac blood of animals from which transfers are made must be consistently negative, as confusing clinical symptoms and immunity tests have been caused by known bacteria.

Statistics and the Health Officer*

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IT is not my purpose to review the rise and progress of preventive medicine. It is enough to say that with the concentration of population in the new industrial cities there came the beginning of sanitation. Then in the last half of the 19th century came the brilliant discoveries of Pasteur, Koch, and a host of other scientists, which now form the basis of the efficient work of the modern health officer.

The record of these triumphs of sanitation and preventive medicine is the subject matter of vital statistics. Vital statistics are inseparable from preventive medicine just as accounting is inseparable from modern business. Without vital statistics the health officer, the modern public health administrator, would be working in the dark. He would have no means of measuring the degree of his success or failure. In a small village where the health officer knows every person in town and where he personally attends to the suppression of nuisances and the enforcement of quarantine, he may not feel the need of vital statistics. His statistics may be kept in his head, and he is not aware that they are statistics. The city health officer, however, is the executive head of a public health organization, and as such he must depend upon statistics as the business executive must judge the state of his business by his accounts and his statistical charts.

The health officer does not need to be a vital statistician, any more than a business man needs to be an accountant, but he should be able to understand vital statistics and to use them effectively in his daily work. He should know the uses and the limitations of every device used in vital statistics, although he may depend upon his statistician to compute even the crude death rate and the infant mortality rate.

The health officer is interested in vital statistics from two standpoints: first, in his capacity as local registrar, as the source of the original data; and second, in his capacity as a public health administrator in which he is one of the chief consumers of the product.

The value of vital statistics depends upon the accuracy and completeness of the original observations, for which the local registrar

* Read before the Health Officers Section of the American Public Health Association at the Sixty-first Annual Meeting in Washington, D. C., October 24, 1932.

is responsible. For the finished statistical product, the statistician is responsible. He must reduce this mass of disconnected observations into the usable form of tables, rates and trends, which are sensitive indices of public health and social conditions. If properly prepared and properly understood and used, these results are an accurate guide to the work of the health officer. Improperly prepared or misused vital statistics may be very misleading.

Statisticians, and those who make use of statistics, are no better and no worse than professional men in other fields. It is one of the reproaches leveled against the medical profession that experts may be obtained to testify on either side of a personal injury case. It is also possible to twist statistics in such a way as to deceive the uninitiated.

At the recent convention of the American Bar Association in Washington, Dean Roscoe Pound told the story of the experience of the Wickersham Commission in the field of statistical analysis. It seems that the Commission had accumulated a vast quantity of undigested material bearing on the subject of their investigation and found that before this material could be used it would have to be boiled down and analyzed by approved statistical methods. The Commission searched far and wide for the highest powered statistician available, and when they had found the man who met the requirements, they presented him with the mass of material and told him to go ahead. The eminent statistician, however, shifted his cigar to the other side of his mouth and asked: " Now, gentlemen, what is it you would like to prove? "

Statistics, like the Holy Scriptures, are usually accepted on faith, and they lend themselves readily to the spreading of false doctrine. The devil can quote Scripture, and the booster, the propagandist, the high pressure salesman, and the unscrupulous advertiser can prove anything by statistics.

Vital statistics, as well as economic statistics, lend themselves readily to the use of the professional booster and to the health officer whose chief interest is his own self-glorification. The public is now thoroughly sold on the advantages of sanitation, and newspaper readers generally have a dim idea that the death rate is a measure of the health of the community. They do not, however, appreciate the refinements of vital statistics. The health officer should understand and correctly interpret the findings of the statistician. For example, the crude death rate is frequently misused by those who do not understand its shortcomings. The crude death rate is easy to compute and readily understood, and is very useful within proper limits,

but beyond those limits it may be grossly misleading. For comparisons between cities or between any two areas of different social composition, it is often improperly used. In a rapidly growing city, the professional booster may call attention to the low death rate of his community as compared with that of some older, slowly growing city. It may be true that there are very few deaths in his city per 1,000 of the population, but it may also be true that many persons who are ill are taken to the hospital in the older community and die there, so that their deaths are not registered in the place of their residence. It may also be that in the rapidly growing city the population is highly selected, with few old people and few very young children. In order to make an honest comparison of death rates between one community and another, the death rate must be adjusted for residence and corrected for age. The adjustment of death rates for residence, as well as the adjustment of birth rates by residence of the mother, can only be made if the information as to residence is accurately stated on the death and birth certificates. The adjustment for residence is often very great, especially in small cities having large hospitals. In Rochester, Minn., for example, the crude death rate in 1929 was 50.4 per 1,000 of the population. Adjustment for residence reduced this rate to 15.7, or less than one-third. The correction for age is particularly important in rapidly growing industrial cities. The crude death rate in Detroit, for example, is much lower than that in Columbus, O., but after correction for age, the refined rates are found to be almost identical.

A classic example of the misuse of crude death rates is found in the frequently quoted statement that as a result of the work of General Gorgas and his assistants the death rate of the Panama Canal Zone was reduced to less than the death rate in the United States. In a speech at Charleston, S. C., December 16, 1915, General Gorgas made the following statement:

> We had on the Isthmus some 10,000 American whites, about one-half of whom were men and the other half women and children. The children were equal in number to the women. The health of these whites was exceptionally good. During 1913 the death rate among the men from disease was about 2.5 per thousand, that among the women and children about 4 per thousand. It would be difficult to find anywhere in the United States in a similar population death rates better than these.

The achievement of the health administration in the Canal Zone in transforming a tropical pest hole into a region in which women and children could live and in which white men could work, did not need any exaggeration, but such statements as those quoted above,

repeated without qualification, are grossly misleading. The facts were that this population was probably the most highly selected group of its size ever brought together in one health administration area. There were no old people and few very young children. All were in the age periods characterized by very low death rates, and furthermore every one who became ill was sent as quickly as possible back to the United States, so that the deaths in the Canal Zone were only those from acute attacks of disease from which death occurred before the patient could be transferred out of the Canal Zone. By 1930 the crude death rate in the Canal Zone had been further reduced to less than half the rate of 1913, but the government even now discourages permanent residence and the report for 1930 of the Health Department of the Canal Zone states that practically all who retire from the service either from disability or age return at once to the United States.

The health officer in the course of his routine work may make use of the crude death rate for the comparison of one month or one year with another in the same area, but for a comparison of different areas, or the comparison of his city with another city, the rates must be adjusted for residence and corrected for age.

For further analysis in large areas, the death rates must be shown for different ages and for different causes of death. These are known as specific rates. Age-specific death rates are shown as the number of deaths of persons of a given age or age period per 1,000 of the population of the same age or age period. Age-specific death rates are high in infancy, low in childhood and in early adult ages, and are very high again in old age. The health officer is mainly interested in the death rates of childhood and middle life. Deaths beyond the age of 50 are usually from degenerative diseases which are largely beyond the control of public health administration.

Specific death rates by cause are usually expressed as the number of deaths from any cause per 100,000 of the population. These rates are sensitive and are particularly valuable as a guide to epidemiologists. Attention can be concentrated on preventable causes, and the trends measured from week to week. Here again comparisons between areas are dangerous without correction for age and residence. The specific death rate from diphtheria, for example, will ordinarily be higher in an area in which 20 per cent of the population is under the age of 10 than in a population with less than 10 per cent in the early age periods.

Infant mortality may be shown as an age-specific death rate for children under 1, or better by a ratio of infant deaths to total live

births. There is no single index of progress in public health more sensitive or more significant than the infant mortality rate based upon the ratio of infant deaths to births. In the good old days before germs were discovered, the mortality of infants was frightful according to modern standards. High as birth rates were in past ages, infant mortality kept the population about stationary. In many communities, less than half of the children born survived their first year. As recently as the generation in which most of us were born, there were more than 150 infant deaths to 1,000 births. In Massachusetts, the infant mortality rate first fell below 150 in 1897. In 1901 it was 138, and in 1909, 127. In 1917, for the first time, the rate was below 100, and in 1931 it was 56. For the entire registration area of the United States the infant mortality rate in 1931 was 62. This rapid reduction in infant mortality is an achievement which can never be duplicated again, for an analysis of infant deaths by cause will show that there are so many deaths from causes which cannot be prevented that infant mortality rates below 40 per 1,000 births cannot be expected except in limited areas in occasional years.

The computation of infant mortality rates depends upon an accurate record of births. The health officer, in his official capacity, may not be directly interested in births, but indirectly his record of births is of greatest importance to him. As has been noted, the number of births is necessary for the computation of the infant mortality rate, and in a general sense he is interested in births as the source of renewal of the population and in the changing birth rate as a means of forecasting the age composition of the population of the future. The crude birth rate, like the crude death rate, is calculated as the number of births per 1,000 of the population. A more accurate measure of the fertility of a population is a refined birth rate obtained first by adjusting births to the residence of the mother and basing the computation not on the population as a whole but on the number of women between the ages of 15 and 45. Still better is the legitimate birth rate based on the number of children born per 1,000 married women between the ages of 15 and 45.

The rapid decline in the birth rate in recent years is as significant as the decline in the death rate. In the " Good Old Days," now happily gone forever, the fate of a married woman was to give birth to a child every year or two until she was worn out and obliged to surrender her place to wife number two. Of 8 to 15 children, perhaps half were " raised " to maturity. The birth rate was probably around 40 per 1,000 and the death rate almost as high. As recently as 16 years ago the crude birth rate in the registration area of the United

States was 25 per 1,000. In 1931 it was 17.8, and it is expected that for 1932 the rate will fall below 17. This is startling enough in itself, but it does not tell the whole story. Because of immigration and the relatively high birth rates of a generation ago, our population in the reproduction age periods is abnormally large. This abnormal age distribution permits the low death rates of recent years, and under ordinary conditions should show a high birth rate. If we make corrections for age, we will find that with births and deaths as they will be recorded for 1932 the completely refined death rate will be higher than the refined birth rate. This means that present refined birth and death rates continue until persons now in middle life become old, the population of the United States, instead of increasing, will begin to decline. The sudden and dramatic change in one generation from a rapidly increasing population to a stationary or a declining population is hard to realize.

With a continuance of present trends, the social problems of the next generation will be vastly different from those of the past. There will be fewer children and more old people, fewer schools and more homes for the aged, fewer deaths from epidemic diseases and more from degenerative diseases. The death rate, now the lowest ever known, will rise again until it reaches the rate of 30 years ago. This rising mortality will be beyond the control of preventive medicine, for the deaths will be from causes which only a fountain of youth can prevent.

The prospect of a stationary population is very alarming to those who fear change, but after all, will it not make for a happier and more prosperous world? Business conditions will become more stable. The needs of the population can be more readily calculated. Social planning will become more practicable. There will be less speculation, particularly in real estate, and less of the ballyhoo of the professional booster.

In the " Good Old Days " we were fatalists. Our attitude was typified by the familiar words " The Lord giveth and the Lord taketh away, blessed be the name of the Lord." In the future the Lord will be relieved of that terrible responsibility. Children will come when they are desired and when born will live out the allotted span of " three score years and ten." Without realizing it, we are moving toward the ideal of a controlled population. The population need not decline. Economic sanctions can be devised which will maintain the birth rate at any desired level. Until some way is found to check the degenerative changes of advancing age, little more can be done to reduce the death rate. The birth rate on the other hand is capable

of reduction to the vanishing point, but at the same time it is responsive to economic conditions.

More than any other person, the health officer is interested in all that vital statistics has to offer. It is on the health officer as registrar that the vital statistician depends for the complete record of births and deaths. The health officer in turn needs vital statistics as a guide to his work and a record of progress. We should not flatter ourselves that all the gains of preventive medicine are secure. Only constant vigilance prevents the return of epidemics against which our population may be losing its immunity. The health officer must use and properly understand the uses and limitations of all the devices of vital statistics, and he should have the benefit of the forecasts of future conditions in his field, which the vital statistician alone can give him.

Maternity Leave in Denmark

THE Danish Women Workers' Union, composed of about 12,000 members, recently adopted a resolution to the effect that the Government and Parliament should be urged to guarantee women workers the payment of their wages in full during a rest period of 6 weeks before and 6 weeks after confinement. At present, women workers in Denmark are entitled to 4 weeks' rest after confinement, together with an allowance payable from public funds, on presentation of a medical certificate, requiring such a rest period.—*Industrial & Labour Information*, XLIV, 6:177 (Nov. 7), 1932. E. R. H.

Study of Bacteriological Methods of Testing and Means of Disinfecting Water with Chlorine

With Particular Reference to Swimming Pool Water*

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SINCE the adoption of continuous feed chlorination of swimming pool water whereby residual chlorine contents of 0.2 to 0.5 p.p.m. may be maintained irrespective of the bathing load, bacterial quality comparable to drinking water has been obtained. In 1926, Stovall, Nichols, and Vincent [1] reported that the relationship between the bacterial purity of the water and the residual chlorine content as measured by the orthotolidine test was so satisfactory that this test could be depended upon as a measurement of sanitary quality. In the same year Mallmann [2] observed such a close agreement in the bacteriological and the orthotolidine tests that he recommended the latter as the sole measurement of the sanitary quality of swimming pool water. Since then numerous reports have appeared showing the absence of *Escherichia coli* in 50 c.c. of water in swimming pools maintaining a residual chlorine content of 0.2 to 0.5 p.p.m. There has been no occasion to question the reliability of these data, until recently in a series of studies on swimming pools, the writers had occasion to test swimming pool water immediately after it was withdrawn from the pool. In 1930, Schoepfle [3] reported that pool side bacteriological tests and tests on the same stored samples tested later at the laboratory were practically the same. He concluded that

> . . . the increment of pollution to the pool water due to swimmers seemed to be handled effectively by maintaining the residual chlorine within proper limits;

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this sterilizing action on the added pollution by bathers seemed to be practically immediate, at least within the time required for making a rapid plating and tubing, that is approximately one minute.

In a recent series of studies Mallmann and Schalm [4] have demonstrated that increased alkalinities in water cause a marked retardation of germicidal action of chlorine. Gerstein [5] found that chloramine could not be used as a disinfectant in Chicago water because of delayed germicidal action. The fact that this latter treatment, because of its lessened taste and odor nuisances, is rapidly finding favor in swimming pool disinfection, and the establishment of delayed killing action of chloramine and of chlorine in alkaline waters, raised the question of their sanitary value for swimming pools. The sterilization of a swimming pool water is quite different from that of a drinking water. In swimming pool water disinfection the residual chlorine must destroy large numbers of bacteria as they are removed from the bodies of the bathers; otherwise during periods of heavy bathing loads, an accumulation of bacteria would occur and, at least, a temporary period of pollution would ensue.

To study the influence of chlorine and chloramine treatment without the interference of such other factors as filtration and dilution, a fill and draw pool of 45,000 gallons capacity was selected. An attempt to use a circulating system pool gave unsatisfactory results as the circulation introduces factors that are difficult to control. Furthermore, chloramine had not been used in a pool with a circulating system prior to the experiment and the possibility of the filters removing the ammonia lends another unknown factor. There is also some question as to whether or not the ammonia, when once introduced into a closed system such as a circulating system pool, would remain available for further combination with chlorine after it had released its initial load for sterilization purposes. Available data indicate that in such a closed system after the initial treatment with an ammonia-chlorine ratio of 1 to 2 or 1 to 3 subsequent treatments can be reduced to 1 to 10.

To determine the necessity of pool-side testing a bacteriological laboratory was set up in the school readily accessible to the pool. For each test two samples were collected simultaneously, one of which was tested immediately while the other was kept and tested several hours later at the city laboratory. The latter was handled in a manner typical of the customary routine. In Table I are presented results representative of a mass of data collected to measure the comparative

TABLE I

VALUE OF POOL-SIDE TESTING VS. REGULAR LABORATORY TESTING

Pool—45,000 gal. capacity—fill and draw type
Treatment—Chloramine
Bathing— 9:30– 9:50 30 men
10:15–10:35 37 men
1:15– 1:35 12 women

		Analyses at pool side		*Analyses at laboratory*	
Time of sampling	*Resid. Cl.*	*Gas in five 10 c.c. samples*	*Count*	*Gas in five 10 c.c. samples*	*Count*
9:25	0.15	0 out of 5	0	0 out of 5	0
10:25	0.18	5 out of 5	65	0 out of 5	0
10:50	0.05	5 out of 5	34	0 out of 5	0
1:00	0.25	0 out of 5	19	0 out of 5	0
1:30	0.25	4 out of 5	22	0 out of 5	0
2:30	0.25	0 out of 5	0	0 out of 5	0

value of pool-side and the customary laboratory examinations. In this particular series of tests, the pool received 3 oz. of chlorine and 1.5 oz. of ammonia, a ratio of 2 to 1, prior to the tests. The pool had been previously emptied and cleaned so it was free of organic matter at the start of the experiment. It will be observed that in each case during the period when the pool was in use, marked pollution, as measured by gas production in lactose broth, was obtained in the pool-side samples. The same samples tested at the laboratory in every instance showed no evidence of pollution. In cases of minimum bathing loads and of high residual chlorine contents (0.5 to 1 p.p.m.) pool-side tested samples failed to show pollution. Thus it would seem that under proper conditions, as pertain to bathing load and amount of residual chlorine, a pool can be maintained according to the standard set by the Joint Committee on Swimming Pools and Bathing places of the American Public Health Association and the Conference of State Sanitary Engineers when examined by pool-side testing.

That such a method of testing is logical, is attested by the fact that the presence of even a minimum chlorine residual indicates the presence of germicidal chlorine. If germicidal chlorine is present, it necessarily follows that any bacteria present are going to be affected accordingly. If a period of time elapses between sampling and testing, a reduction of the bacteria must result. Granted a sufficient period and a sufficient amount of residual chlorine, an otherwise polluted sample would be sterile when tested.

In the following studies only the results of pool-side testing will be

reported as, in practically all cases, the samples tested at the laboratory were sterile. Also the presence of streptococci will be reported. The regular Durham lactose broth tubes were examined for the presence of these organisms. The method of detecting streptococci consisted of a macroscopic examination followed by a confirmatory microscopic examination. Macroscopically, a presumptive test for streptococci may be made by holding the suspected tube to the light and examining for a granular precipitate having a close resemblance to the precipitate obtained in an agglutination test. Frequently, a granular floc adheres to the outer sides of the tube and on the outer surfaces of the inverted vial. Although the appearance of the granular precipitate is not always confirmed microscopically, the absence of such granular precipitates does not demand microscopical examination.

Mallmann and Schalm [4] demonstrated in a series of laboratory experiments that increasing alkalinities caused a decreased activity or delayed killing action of chlorine. It will be observed that at the same pH values, a marked similarity exists between chlorine and chloramine in the germicidal activity. That increasing pH values cause a decrease in the germ killing speed of chloramine, as well as chlorine, is demonstrated in Figure I. It will be noted that at pH 6, the killing rate is much more marked than at pH 7.7.

To determine the practical value of chloramine treatment, a fill and draw pool of 45,000 gal. capacity was treated with chloramine using calcium hypochlorite and ammonium sulphate as sources of chlorine and ammonia respectively. Prior to the experiment the pool was emptied and cleaned. One ft. of water was admitted, followed by 12 oz. of ammonium sulphate. After another ft. of water was added, 6 qt. of calcium hypochlorite solution (20 lb. to 20 gal. of water) was introduced. The pool was then filled. The applied chlorine was in the proportion of 1 p.p.m. and the ammonia-chlorine ratio was 1 to 2. Frequent duplicate samples were taken throughout the day during periods of use and rest to obtain a complete picture of the bacterial pollution. One set of

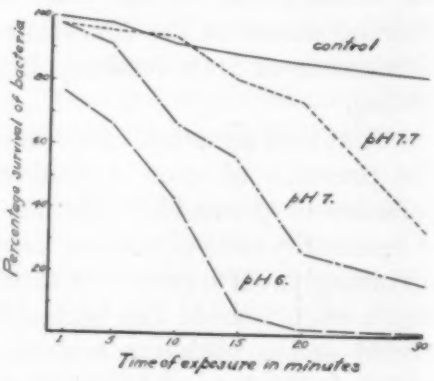

FIGURE I—Influence of varying the pH on a constant chloramine content in killing *E. coli*

samples was tested immediately after collection. The results are presented in Figure II. It will be observed that the colon bacilli indices rise during the period of use and fall during the intervening rest periods; that the streptococci indices follow the same trend as the colon bacilli indices, except that streptococci are less frequent; that the residual chlorine content remains fairly constant although no additions of chlorine were made during the period of the test. During the rest periods between bathing loads, sterilization was not effected although a fall in colon bacilli and streptococci indices is evident. In considering these data it should be remembered that the other set of samples collected in the usual manner and tested later in the city laboratory without exception failed to show either streptococci or colon bacilli in all tubes. It may be concluded from these data that 0.5 p.p.m. available chlorine as chloramine failed to control pollution as measured by colon bacilli and streptococci indices.

The following day, after emptying and cleaning the pool, chlorine treatment was tested under as nearly identical conditions as possible. The pool was treated with 6 qt. of calcium hypochlorite solution (20 lb. to 20 gal. of water) to give an applied dosage of 1 p.p.m. At the start of the experiment the pool had a residual chlorine content of 0.45 p.p.m. The data are presented in Figure III. A similar set of data was obtained during periods of rest, except that greater and sharper falls in pollution indices were obtained. The streptococci and colon bacilli indices follow the same trend; the streptococci, how-

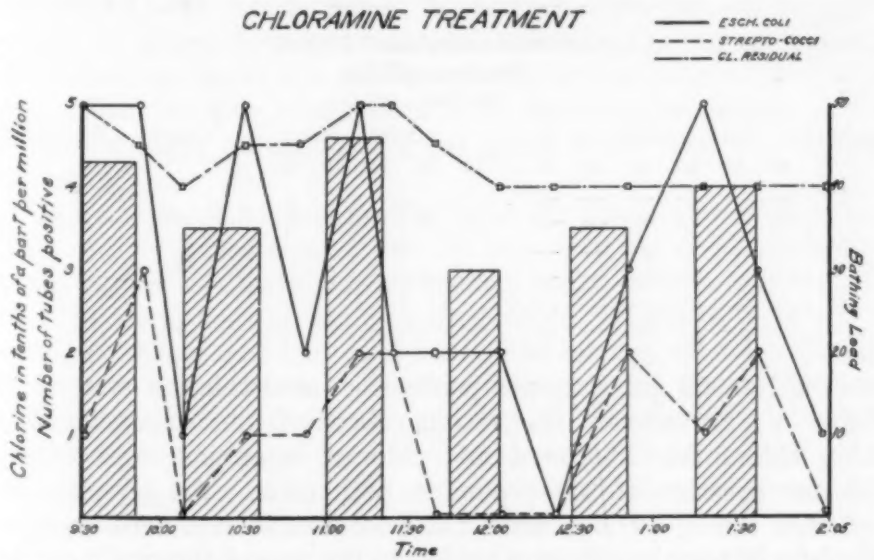

FIGURE II—Relationship of pollution, chlorine residual contents, and bathing load in a chloramine treated swimming pool

ever, having a lower incidence. The residual chlorine content fell rapidly and it was necessary to make additions to keep it above 0.2 p.p.m.

It will be observed that as the residual chlorine content falls a marked increase in colon bacilli and streptococci indices occurs. Recovery after pollution was always very rapid. In other tests not presented, under conditions as above, sterility generally occurred within 10 minutes after the bathers had left. This was not true with chloramine treated pools or chlorine treated pools with alkalinities of pH 8.

In the studies cited, the incidence of colon bacilli was considerably higher than that of streptococci. That this relationship is not always true is shown in Tables II and III. These samples were obtained

TABLE II

COMPARISON OF CHLORINE AND CHLORAMINE TREATMENT OF SWIMMING POOL WATER

Treatment—Chloramine—0.1 p.p.m.
Reaction—pH 7.8
Bathers—247

Sample No.	*Gas in lactose broth*						*Streptococci*						*Count*	*Organism*
	10	10	10	10	10	1	10	10	10	10	10	1		
1	+	+	+	+	−	−								
	+	+	+	+	−	−	+	+	+	+	+	+	Inn.	*A. aerogenes*
2	+	+	+	−	−	+								
	+	+	+	−	−	+	+	+	+	+	+	−	Inn.	*A. aerogenes*
3	+	+	−	−	−	−								
	+	+	+	−	−	−	+	+	+	+	+	−	Inn.	*A. aerogenes*

Treatment—chlorine—0.1 p.p.m.
Reaction—pH 7.3
Bathers—283

Sample No.	*Gas in lactose broth*						*Streptococci*						*Count*	*Organism*
	10	10	10	10	10	1	10	10	10	10	10	1		
1	+	−	−	−	−	−								
	+	+	+	−	−	−	+	+	+	+	+	−	40	*E. coli*
2	−	−	−	−	−	−								
	−	−	−	−	−	−	+	+	+	+	+	+	25	
3	−	−	−	−	−	−								
	−	−	−	−	−	−	+	+	+	+	+	+	350	

from a 260,000 gal. out-door pool with a recirculation system. In Table V, are shown the results obtained on successive days, using chloramine treatment and chlorine treatment with residual chlorine contents of 0.1 p.p.m. in both cases. All samples were collected during periods when the pool was in use. Although the numbers of colon bacilli were far less in the case of chlorine treatment there was no change in the incidence of streptococci. Table III gives

TABLE III

COMPARISON OF CHLORINE AND CHLORAMINE TREATMENT OF SWIMMING POOL WATER

Treatment—chloramine—0.6 p.p.m.
Reaction—pH 7.6
Bathers—740

Sample No.	*Gas in lactose broth*					*Streptococci*					*Count*	*Organism*
	10	10	10	10	10	10	10	10	10	10		
1	—	—	—	—	—							
	—	—	—	—	—	+	+	—	+	+	32	
2	+	+	—	—	+							
	+	+	—	—	+	+	+	+	+	+	226	*A. aerogenes*
3	—	—	—	—	—							
	—	—	—	—	—	+	+	+	+	+	41	

Treatment—chlorine—0.6 p.p.m.
Reaction—pH 6.9
Number of bathers—273

Sample No.	*Gas in lactose broth*						*Streptococci*						*Count*
	10	10	10	10	10	1	10	10	10	10	10	1	
1	—	—	—	—	—	—							
	—	—	—	—	—	—	+	+	—	+	+	—	0
2	—	—	—	—	—	—							
	—	—	—	—	—	—	+	—	+	+	—	—	0
3	—	—	—	—	—	—							
	—	—	—	—	—	—	+	—	—	—	—	—	0

the data obtained from the same pool using 0.6 p.p.m. available chlorine in the case of both chlorine and chloramine.

In this case, colon bacilli were absent from the chlorine treated water and a marked reduction in the number of streptococci occurred. It may be stated, however, that both colon bacilli and streptococci follow the same trend as a measurement of pollution in a chlorinated pool. Their relative relationship as to numbers apparently varies. Insufficient data on this particular point make any explanations impossible.

The writers are not prepared to weigh the significance of the colon bacilli and streptococci as found by means of the pool-side testing during periods of use of the swimming pool. Whether or not the pollution found has any sanitary significance remains to be seen. It is true, however, that the usual method of testing, whereby samples are held for a period of time between collecting and testing, does not give a true picture of the sanitary quality of a swimming pool. Such methods of testing as are now in general use are to be condemned as giving a false sense of security if we are to consider the presence of the colon bacilli and streptococci as a criterion.

The disappearance or loss of residual chlorine varies with the conditions under which the chlorine is introduced. A number of investi-

gators have reported that chloramine treatment stabilizes the residual chlorine content. To obtain confirmatory data upon this point, residual chlorine contents were observed under 3 conditions, namely, high alkalinity (pH 7.3–7.9), neutral reaction (pH 6.8–7.2), and chloramine treatment (pH 7.2). The data are presented in Table IV. In the case of the chloramine treatment, although only an initial dose of calcium hypochlorite was made, the residual chlorine content remained practically constant. With chlorine treatment at pH 6.8 to 7.2, 33 per cent more chlorine was necessary to retain a minimum dose in excess of 0.2 p.p.m. available chlorine with a considerably smaller bathing load. With chlorine treatment pH 7.3 to 7.9, the chlorine loss was not as great as pH 6.8 to 7.2 but more so than with chloramine treatment. However, although delayed killing action occurred, the extent of pollution during periods of use was far less than with chloramine treatment. On the other hand, the chloramine treated pool with an average residual chlorine content of 0.45 p.p.m. showed marked pollution during periods of use as measured by pool-side testing. The stability of chlorine residuals in chloramine treated pools has little value if the sanitary quality of the pool is sacrificed. Examination of 3 chloramine treated pools with chlorine residuals of 0.1 to 0.6 p.p.m. has failed to show the desired sanitary quality as measured by pool-side testing.

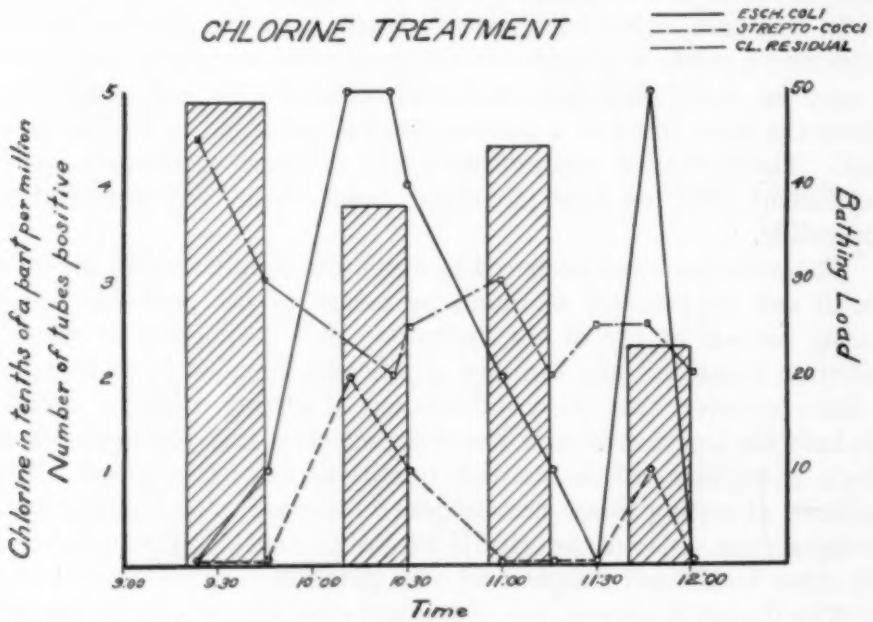

FIGURE III—Relationship of pollution, chlorine residual contents, and bathing loads in a chlorine treated swimming pool

TABLE IV

STABILITY OF CHLORINE IN ALKALINE CHLORINE, NEUTRAL CHLORINE AND CHLORAMINE TREATED POOLS

Alkaline chlorine			*Neutral chlorine*			*Chloramine*		
Amnt. cl. added	*Res. cl.*	*Bathing load*	*Amnt. cl. added*	*Res. cl.*	*Bathing load*	*Amnt. cl. added*	*Res. cl.*	*Bathing load*
10 oz.	0.7	20	6 oz.	0.45	49	6 oz.	0.5	
	0.6	48		0.3			0.5	43
	0.7	40		0.2	38		0.45	
	0.6		2 oz.	0.25			0.4	35
	0.5	28		0.3	44		0.45	
	0.4			0.2			0.45	
	0.5	41		0.25	23		0.5	46
	0.5			0.25			0.5	
	0.5			0.2			0.45	30
	0.5	35					0.4	
	0.25						0.4	34
	0.25						0.4	40
							0.4	
							0.4	
							0.4	
10 oz.		232	8 oz.		154	6 oz.		237

The writers feel that the present method of sampling should be supplanted by a method of pool-side testing. Pool-side testing is, of course, out of the question as a routine procedure, but a method of collecting samples in sodium thiosulphate treated bottles makes possible the elimination of the residual chlorine so that the sample can be transported to the laboratory without destruction of the bacteria.

The bottle is prepared by adding a small crystal of sodium thiosulphate to a moist bottle or 0.5 c.c. of tenth normal sodium thiosulphate to a dry bottle subsequent to sterilization by moist heat. Care must be taken not to rinse the bottle in collecting the sample. The sodium thiosulphate added is sufficient to neutralize a residual chlorine content of at least 1 p.p.m. The results obtained from sodium thiosulphate treated bottles and from pool-side tested samples are similar.

Samples collected from chlorinated swimming pools should be taken during use to determine the presence of transient pollution. Samples taken during periods of rest will, if collected 15 to 30 minutes after use, generally fail to show pollution. All samples should be collected in sodium thiosulphate treated bottles.

The building up of pollution in the swimming pool in the presence of residual chlorine would seem to indicate that bathing loads should be regulated to avoid excessive pollution. The view that the presence of residual chlorine indicates the absence of bacteria must be revised.

Further work on this phase of the problem is in progress in a number of swimming pools in Detroit and Lansing.

This report is very largely of a preliminary nature and will be followed by reports on more complete studies.

SUMMARY

1. Samples of swimming pool water collected during periods of use and tested immediately showed more pollution than duplicate samples handled in the usual manner by storing and testing later.

2. During periods of use, swimming pool water showed marked pollution as measured by colon bacilli and streptococci indices in the presence of residual chlorine contents of 0.2 to 0.5 p.p.m.

3. During periods of rest, the pollution evidenced during use, disappeared. The rate of disappearance depended upon the type of treatment used.

4. With chloramine treatment, a delayed germicidal action occurred. This was also true of chlorine treatment in alkaline water, but to a lesser extent.

5. The colon bacilli and streptococci indices roughly parallel each other. The preponderance of the colon bacilli and streptococci incidences varies.

6. A sodium thiosulphate treated sample bottle is recommended for collecting pool samples.

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EDITORIAL SECTION

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PREVENTION OF RICKETS

THE prevention of rickets is a very live question in spite of the fact that with direct irradiation, ultra-violet rays, cod liver oil or its concentrates, Haliver oil, viosterol, activated milk, etc., we have more specifics for it than for any other single disease. It is, however, extremely prevalent, even in quarters where it would be least suspected.

There is a growing feeling that some form of antirachitic milk is the best preventive as well as curative, since it has the marked advantage of a high content of calcium and phosphorus. Another point which has been brought out before, but was emphasized by several speakers in the recent symposium at our 61st Annual Meeting, is that the results of standardization of antirachitic agents as units per c.c. or per quart, does not accord with clinical experience. Much more viosterol is needed to protect infants than would be expected from the assays on rats. Several of the speakers, led by Hess, pointed this out. There is no doubt that the estimation of human dosage on the basis of rat assays is fallacious when compared with clinical results, though until the work of Hess and Lewis appeared, these biological assays entirely overshadowed clinical data, which after all constitute the essential criterion.

There are a number of ways of increasing the antirachitic potency of milk. One which seems to be favored by Hess [1] above others is the feeding of activated yeast to the milch cows. He considers it

especially applicable to certified dairy farms, since one can be sure of the quality of the yeast used, the ration fed, and frequent biological assays of the milk. For the general supply of large communities, the method does not seem applicable at present. However, irradiation of the milk can be carried out at a central station. An exposure of 16 seconds to certain carbon arc rays is sufficient for the purpose, and this does not develop any bad odors or tastes, nor are the vitamins injured. Extensive experiments over two winters in New York has shown that such irradiated milk will prevent rickets practically without exception, even in negro infants, who are particularly susceptible. The amount of milk fed these infants was only 2/3 quart daily, instead of the quart usually recommended.

Hess further points out that laboratory experiments show that a greater number of antirachitic units are required when viosterol is given than when cod liver oil is used, and has suggested that in addition to vitamin A, cod liver oil contains something of value against rickets which is not present in irradiated ergosterol. He believes that we should be guided by the clinical activity of our antirachitic agents instead of depending too much upon the laboratory assay. He supports strongly the use of activated milk, fluid or dry, since it has the advantage of providing an automatic method for the prevention of rickets, supplies the essential factor in a medium rich in phosphorus and calcium, and the results are obtained by means of an exceptionally small amount of the antirachitic factor.

Another paper [2] given in the symposium reported on milk irradiated with the carbon arc lamp, milk from cows fed irradiated yeast, and from cows irradiated directly with the carbon arc lamp. The results were closely comparable with these obtained by Hess. Clinical studies on infants in a large foundling home over a period of nearly 8 months were entirely satisfactory, and in two other hospitals, children with marked rickets were treated with prompt cure in every instance.

The direct irradiation of cows with the carbon arc lamp is carried out by placing a lamp between pairs of cows so that only one side of the udder and abdomen are irradiated. The type of lamp used is the same as for the direct irradiation of fluid milk. The experiment so far has included 50 cows. Each was irradiated for 15 minutes daily, and the treatment was begun 2 weeks before the milk was used. These experiments have gone on for 9 months. The results on 21 infants over a 6- to 8-month period practically parallels those produced by irradiated fluid milk. The authors believe that irradiation of the cow has certain advantages over the irradiation of fluid milk,

and that it can be used not only in herds producing certified milk, but those of smaller communities. They also believe that it is considerably cheaper than other methods for institutions which care for a large number of infants.

Another paper [3] in the symposium gave the results of experiments which have been going on at Columbia University for several years; namely, the purification and improvement of a concentrate from cod liver oil which contains the antirachitic element. This concentrate, in the proportion of 1 part to 12,000 of milk, will give practically 150 units of vitamin D per quart, equivalent to 3 teaspoons of cod liver oil. The concentrate may be added in several different ways, but the one apparently preferred by Zucker is to add it to the cream, pasteurize the milk, and recombine the two. Only 15 experiments on rachitic infants have been carried out by this method so far, but the results were entirely favorable and comparable to those obtained by a dosage of 3 teaspoons per day of cod liver oil. The author believes that this offers perhaps the best and safest method, since the concentrates are carefully assayed, and there is no possibility of accidental overdosage. So far, one dairy has been licensed to produce such milk, and the additional cost is said to be 1/25 cent per quart.

Some authorities object to what they call doctoring milk, and at present the addition of foreign material will probably meet with some opposition from the authorities carrying out the pure food laws, but if it is shown to be better than other methods, these laws can be changed.

This symposium contains much food for thought, and through the labors of these experts, we have learned of a practical method for the prevention of the widespread disease, rickets.

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MOTTLED ENAMEL

WE wish to call attention to a situation in connection with public health activities which in some respects has unique features. Some years ago it was found that the permanent teeth of all the children born in Chetopa, Kansas, were afflicted with what is known as "mottled enamel." Recent investigations have shown that this

pathological condition, which occurs in many districts of the United States, is induced by the presence of fluorine in the drinking water. The water of the artesian well which supplies Chetopa was found to contain over 9 parts per million of fluorine, an amount which invariably leads to damaging and disfiguring lesions of the dental enamel.

For several years Dr. J. Scott Walker, a practicing dentist in that city, called public attention to the dangers of the situation with the result that it was proposed to bond the city to the amount of $25,000 for a new water supply which would be free from fluorine. Last August this proposal was voted on but defeated, which meant that the dental defects would continue to develop in succeeding generations. Dr. Walker has continued his agitation and has brought it about that the monthly water bills bear the legend: "This water is unfit for consumption by children." It is clear that the matter is by no means settled.

This incident is of interest to public health authorities, not only because the officials of this community decided to save money rather than to eradicate a menace to the health of the community, but even more so because it illustrates what can be done by an energetic and persistent individual in the face of a lack of coöperation. The ingenious method of calling direct attention of the residents to the limitation in potability of the water might be of service to others who are concerned with similar problems.

BERNHARD BANG

FROM Europe comes the notice of the death of Bernhard Bang, one of the leading veterinarians of his time, in his 85th year.

The announcement of the discovery of the tubercle bacillus by Koch came 2 years after his graduation in veterinary medicine. He was one of the early converts to the science of bacteriology and carried out researches on many of the infectious diseases of domestic animals, two of which at least are known to be communicable to man—tuberculosis and bovine abortion. He devoted a great deal of time to the study of the eradication of bovine tuberculosis from cattle, and in 1894 put forth the method known by his name for converting a diseased herd into a healthy one, based on the knowledge that tuberculosis is not an inherited disease. His plan was to separate the newborn calf from the diseased mother within 48 hours of birth, and rear it on milk from a healthy nurse mother, or else on pasteurized milk.

When the diseased cattle had open tuberculosis and were dangerous spreaders of the germ, they were slaughtered. The method required a clean barn free from infection in which the new-born calves were reared, and kept when grown, the diseased cattle being housed in a separate building and gradually sold or killed. The method was successful, but has not been largely adopted in the United States on account of the expense. Bang and Nocard were the first two to inoculate cattle with emulsions of the tubercle bacillus intravenously, the animals being slaughtered within an hour and the tissues examined for the germ of tuberculosis. Their experiments were negative. The object was to determine whether or not the eating of meat from tuberculous animals was dangerous to man.

The second discovery of Bang was that of the germ of contagious abortion, described in 1897. He did not recognize it as being related to the bacillus of Malta fever, isolated by Bruce some 10 years before, but, in 1918, Alice Evans, of the Hygienic Laboratory of the U. S. Public Health Service, now the National Institute of Health, showed the close relationship between the two organisms. Since that time it has been found that the disease is quite widely spread. A number of outbreaks in cattle have occurred, and a considerable number of cases of undulant fever due to the organism have been observed in man.

Bang was born in Zealand, educated there and at Copenhagen. He was appointed Professor of Internal Diseases in the Royal Veterinary College in Copenhagen in 1892, and retained the chair until 1914. We owe much to veterinary science in the development of bacteriology and the study of disease of animals transmissible to man, and to Bernhard Bang, our debt is especially heavy.

ASSOCIATION NEWS

WILLIAM HALLOCK PARK, M.D.

WILLIAM Hallock Park has been awarded the Sedgwick Memorial Medal for distinguished service in public health. The choice was unanimous and enthusiastic, and the announcement at the Washington Annual Meeting was greeted with hearty and spontaneous applause. Dr. Park's work and accomplishments had placed his name in the hall of fame long before this recognition of his achievements. It is given to few men to serve so long and so well. For 39 years Dr. Park has been Director of the Bureau of Laboratories of the Department of Health of the City of New York. He was a pioneer in bacteriology and was of the vanguard in the march of

progress in the practical applications of immunology.

There is not a single disease on our list of communicable infections to which Dr. Park has not made notable contributions, especially in the matter of laboratory aids to diagnosis, and where biologic preparations helpful in prevention or cure were concerned. His contributions to the scientific side of hygiene and sanitation have constituted him an authority and given him world-wide recognition. His profound knowledge of the subject, his rich background of experience, his critical insight, and unusual fund of common sense have made him a guide as well as an authority in sound public health practice. Dr. Park is an able teacher, a prolific author, a stimulating investigator, and an inspiring leader. He has dedicated his life to work for the betterment of mankind. His kindly disposition, great patience, and fine qualities have made him a man among men. He is loved by his many friends. In honoring him the American Public Health Association honors itself. Dr. Park, enshrined in the hearts of his colleagues, takes an abiding place as a fixed star of first magnitude in the galaxy of preventive medicine.

He has been a member of the A.P.H.A. since 1912, and is a Charter Fellow, elected in 1923.

M. J. ROSENAU, *Chairman*
Sedgwick Memorial Medal Committee

LONG AND CONTINUOUS SERVICE

THE JOURNAL gladly notes the long period of continuous health service of Dr. G. D. Lummis, Health Officer of Middletown, Ohio. Dr. Lummis was appointed part-time health officer of this city in May, 1890, and has served continuously as health officer since that time. In 1927 when the population of the city reached 30,000, the position of health officer was placed on a full-time basis.

Dr. Lummis's experience has been utilized also in state and national health organizations. As an early member of the Committee on Administrative Practice of the American Public Health Association, he participated in the first conferences arranged to prepare the appraisal form for city health work. In 1917, Dr. Lummis was appointed to the Ohio State Health Council and still serves.

In commenting upon his administrative health experience, Dr. Lummis states that he has never attempted a new departure without the advice and approval of the local medical profession. He believes that " no efficient piece of public health work can be accomplished without the coöperation of the medical profession." He also believes that no health department can carry on successfully without a sufficient number of good public health nurses, and he prefers the generalized plan of organization, which is carried out in Middletown.

Under the Health Officer's direction, Middletown has for 11 years maintained a Fresh Air Camp, financed by a private organization. Here 80 children of ages 8 to 12 are cared for each summer for a period of 10 weeks. The camp is of modern construction and has permanent buildings, a sewage disposal plant, city water supply, and all the facilities of a complete camp. During the past summer the average gain in weight per child was 5.8 pounds.

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A.P.H.A. by the Sub-Committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

Health Officers Section

R. Dow Collins, M.D., Whitesburg, Ky., Director, Letcher County Health Department

Frederick T. Fitch, M.D., 43 Main St., East Hampton, Conn., Health Officer

J. Norman Henry, M.D., 1906 Spruce St., Philadelphia, Pa., Director, Dept. of Public Health

Clarence R. Hepler, M.D., Court House, Wichita, Kans., County Health Officer

Clarence S. Morse, Board of Health, Amesbury, Mass., Agent, Board of Health

Laboratory Section

Elfreda L. Caldwell, S.B., Andalusia, Ala., Director, Field Research Laboratory, State Department of Health

Ruth T. Humiston, A.B., Hurlock, Md., Assistant Bacteriologist, State Department of Health

Charles A. Stuart, Ph.D., Brown University, Providence, R. I., Professor of Bacteriology

Public Health Engineering Section

Frank S. Tainter, 142 Maiden Lane, New York, N. Y., Engineer, New Jersey State Department of Health

Industrial Hygiene Section

Michael A. Eiben, 4587 S. Hills Drive, Cleveland, O., Dust Collecting Engineer, Northern Blower Co.

Harold H. Keller, 1835 Arch St., Philadelphia, Pa., Medical Department Manager, Bell Telephone Company of Pa.

Child Hygiene Section

Harrison W. Ferguson, D.D.S., 347 Fifth Ave., New York, N. Y., Author and Lecturer (Assoc.)

Elba L. Morse, R.N., Marquette, Mich., Supt., Northern Michigan Children's Clinic

Laura B. Wilson, R.N., 125 De Soto St., Pittsburgh, Pa., Supt. and Director of Nursing, Children's Hospital of Pittsburgh

Public Health Education Section

Mary Bottje, A.B., 190 Jordan Hall, Ann Arbor, Mich. (Assoc.)

Eunice E. Fetterly, A.B., 711 Arch St., Ann Arbor, Mich., formerly Instructor in Hygiene, North Carolina College for Women

Marie P. Hart, M.A., 15 Greenwood Ave., Bethel, Conn., Public Health Nurse

Dorothy M. Henderson, M.D., Van Hornesville, N. Y., Medical School Supervisor

Anna L. Ketch, R.N., 10 Park Place, Morristown, N. J., Director, Morris County Tuberculosis Assn.

Cornelia McKinney, M.A., 1527 Avenue J, Huntsville, Tex., Teacher, Biology Dept., Sam Houston State Teachers College

Francina McMahon, 88 9th St., Glendale, W. Va., County Health Nurse

M. Nadkarni, M.B.B.S., Ann Arbor, Mich., Student (Assoc.)

Joseph E. Ransdell, LL.D., 1381 National Press Bldg., Washington, D. C., Executive Director, Conference Board, National Institute of Health

Mrs. Inez G. Richardson, 5122 Interior Bldg., Washington, D. C., Administrative Assistant, White House Conference on Child Health and Protection

Public Health Nursing Section

Helen Bean, R.N., 2 Park Lane, Mt. Vernon, N. Y., Nursing Field Representative, Amer. Red Cross

Margaret A. Bulkley, R.N., City Hall, 241 W. South St., Kalamazoo, Mich., Supervisor of Nurses

Margaret L. East, R.N., State Board of Health, 532 W. Main, Louisville, Ky., Director, Bureau of Public Health Nursing,

Kathleen M. Leahy, A.B., 901 W. Franklin St., Richmond, Va., Professor of Public Health Nursing, College of William and Mary

Mary I. Mastin, R.N., 722 State Office Bldg., Richmond, Va., Director, Bureau of Public Health Nursing

Gertrude Osborne, R.N., 31 Church St., New London, Conn., Supervisor, Visiting Nurse Assn.

Epidemiology Section

Filip C. Forsbeck, M.D., Lansing, Mich., Epidemiologist, State Dept. of Health

NeoKarl Yang, M.D., Dept. of Health, Shanghai, China (Student at Johns Hopkins—Assoc.)

LETTER TO THE EDITOR

To the Editor:

CLEANLINESS Institute has been added to the list of organizations which have become victims of the prolonged economic depression. On December 14, at the 1932 Annual Meeting of the founders and supporters, the Association of American Soap and Glycerine Producers, Inc., it became evident that no new money for a third 3-year agreement, not even for a 1-year-1933 budget, was available from the member companies. So, on the basis of a decision by the Board of Directors, plans were immediately made to discontinue Institute professional activities and disband the staff.

On December 15, all full-time members of the Institute staff and office force—48 in number—were assembled by the general manager of the Soap Association, who regretfully gave all present notice of dismissal. It is expected that the exodus of staff will be completed January 15, 1933, by which time the health, school, industrial, and editorial services will have wound up their respective work.

From the beginning, the Board of Directors of Cleanliness Institute gave its professional staff freedom of action in dealing with cleanliness in relation to other subjects. As a staff, we saw very little of these, our generous supporters, for their meetings were infrequent and brief. We believed in our work and are deeply sorry that economic circumstances make continuance without interruption impossible.

During the life cycle of 6 years the professional staff of the Institute received from health and education leaders all over the country many evidences of friendliness, encouragement, appreciation, and interest in this large scope experiment in cleanliness. We are already somewhat scattered, but if my associates knew I was taking this means of thanking the thousands of health officers, public health nurses, and others, with whom I, myself, have been in touch during this period, I am sure they would join me in this expression of gratitude.

At the same time, in this public way, I would like to pay tribute to my former associates in Cleanliness Institute. Most of their names are already familiar to many of the readers of this Journal. They include in the Health and School Service, Julia B. Tappan, Mary P. Landrine, C. Margaret Munson, Evelyn R. Noé, Lillian Peltz, and Anne Raymond; in Editorial Service, Florence M. Seder, Helen B. Ames, Diana Erler, and Josephine Nelson; in Industrial Service, Nelson N. Marshman; in Administration, Roscoe C. Edlund.

W. W. Peter, M.D., Dr.P.H.

PUBLIC HEALTH ADMINISTRATION

Anderson County (S. C.) Health Unit—Within 30 days following the completion of its fiscal year on October 1, the Health Unit has distributed an annual report which pictures the progress of health work in this area during the past 10 years with particular reference to the reduction in the prevalence of smallpox, typhoid fever, diphtheria, and pellagra.

This County Health Department boasts of a personnel of 3 individuals: 1 physician, 1 public health nurse and 1 stenographer. In 1932 the amount appropriated was $6,000, only 7 cents per capita.

The number of reported cases of smallpox has steadily decreased with the increase in the number of vaccinations. Last year no case of smallpox was reported. During the 10-year life of the Health Unit 20,664 smallpox vaccinations have been performed. There have also been 78,220 typhoid inoculations with a steady decrease in the morbidity rate. With the protection of 4,289 children the diphtheria death rate has been reduced by 50 per cent. Sanitation, malaria control work, supervision of dairy farms, and maternity and infancy hygiene have received particular emphasis.—Anderson County Health Unit, S. C., 1932.

Rockefeller Foundation — During 1931 the Foundation has extended its coöperative services for the control of disease, not only by supporting research and epidemiological studies but more especially has directed its effort toward extending knowledge concerning the cause of illness. In this work assistance has been granted to 47 countries throughout the world and the health departments of 37 states have been aided. Assistance has not been limited to central health services but has also been granted to local authorities.

To the Health Organization of the League of Nations contributions have been made to assist in the international interchange of public health personnel and to maintain a world-wide system of health statistics. Among the special activities may be mentioned those in connection with tuberculosis, respiratory diseases, undulant fever, and special studies of sanitation and administrative service. Noteworthy in the field of research is the work on hookworm, malaria, and yellow fever. —The Rockefeller Foundation, *Annual Report*, 1931.

Medical Participation in School Health Service—Recently, the Detroit Department of Health has been compelled to exercise several economies in its program due to the inability of the city to provide all of the funds appropriated for the current fiscal year. The two services which have been eliminated are the School Dental Service and the group of part-time physicians who performed the physical examinations for school children. The dental service has been reëstablished in two ways: In the first place the Children's Fund of Michigan has appropriated $25,000 with which to maintain an emergency dental service in the school clinics, and, second, the District Dental Society, through a group of volunteer dentists, has provided a dental examination for school children and is manning the central clinic of the Department of Health.

Through the coöperation of the

Wayne County Medical Society, there are approximately 100 physicians who are giving 2 hours every other week for physical examinations for children in the public and parochial schools. Of special note is the fact that the Board of Education has officially designated the Medical Society as an agency to coöperate with the Health Department in providing such examination. The Director of the School Health Service of the Health Department is Secretary of a sub-committee of the County Medical Society which directs the service.

As a means of carrying on during the emergency created by the depression, this plan has proved highly satisfactory and has stimulated a further interest on the part of the physician in the program of medical participation in health work. Through this coöperative plan more and more physicians are becoming impressed with the need of health service for school children and are assuming greater interest in the plan for periodic health examination to be conducted among their own clientele.

A Revenge Epidemic—The Greenville, S. C., health officer recently recorded an epidemic of vomiting, involving hundreds of cases reported by physicians, each case being attributed to the ingestion of sandwiches containing mayonnaise from a single shop. Symptoms included nausea, vomiting from 20 minutes to 3 hours after eating, abdominal cramps or dull aches of varying duration, with occasional cases of diarrhea. The patients were ill for 1 or 2 days.

Epidemiological studies and inspections, coupled with laboratory tests, revealed an interesting course of events. Until 2 weeks prior to the trouble, Mrs. A and Mrs. B had conducted a sandwich shop in partnership. Disagreement terminated the partnership and caused Mrs. B to open a shop in competition next door to Mrs. A. Evidence was secured that Mrs. A had been seen in Mrs. B's plant without permission or knowledge of the owner. Among several cans of cottonseed oil in good condition was found one can which contained fish oil. It was also established that the contents of this can had been used for the manufacture of mayonnaise used in the sandwiches in question, the strong odor not having been detected by the workers until after the epidemic.

Laboratory examination of the mayonnaise and oil revealed a glucose-fermenting motile bacillus which was identified as *Bacillus enteritidis*. It was concluded that Mrs. A desired revenge, substituted fish oil for cottonseed oil, hoping to create a bad taste in Mrs. B's mayonnaise. The fish oil was made from fish heads and tails, by-products of the fishing industry, providing a habitat for organisms of the enteritidis family.—Irving S. Barksdale, M.D., *South. Med. & Surg.*, Charlotte, 94, 10 (Oct.), 1932.

A Recreation and Health Project—The Bellevue-Yorkville Health Demonstration Center has coöperated since 1927 with local agencies, including the National Safety Council, in the development of a recreation program for the district where fatal accidents were high, especially among children under 15 years. Increased recreation facilities were developed, and grade school buildings were opened as vacation playgrounds. The yard playground, utilizing space in sections where large grounds are too costly, has proved of value but difficult to administer. Day outings for children, when conducted regularly and scheduled for places not too crowded, proved beneficial.

Auxiliary play services in clinics demonstrated the possibility of making children's waiting rooms attractive to the child. Volunteer service in supervising the use of toys and talking with

mothers regarding children's play habits became a useful supplement to health education given to mothers and children by the clinic nurse. A safety patrol plan proved successful in the majority of playgrounds. Educational material consisting of display posters, pamphlets, and project suggestions were helpful to playground directors.—Thelma E. Carpenter and Savel Zimand, *Recreation Program of the Bellevue-Yorkville Health Demonstration,* 1927–1930, New York, 1932.

Bridgeport, Conn.—In the 1931 report of the city health department (population 147,101), attention is directed to a decrease in diphtheria from 254 cases and 18 deaths in 1925 to 32 cases and 1 death in 1931. In 1925 there were 143 cases of diphtheria admitted to hospital as contrasted with 26 in 1931. In 1922, hospital days (3,095) for diphtheria amounted to 23 per cent of the total days for all admissions (average 17 days each), while in 1931, only 1.4 per cent of the communicable disease hospital days were for diphtheria (313 days, average 12 days). Last year, 182 scarlet fever cases averaged 26 days in hospital.—*Bridgeport Municipal Register,* 1931.

LABORATORY

REPORT OF THE REFEREE ON OYSTER ANALYSIS*

THE last report of the Committee on Standard Methods for the Bacteriological Examination of Shellfish was presented and adopted in 1920, and was printed in *The American Journal of Public Health,* Vol. xii, p. 574 for July, 1922.

Since that time the method recommended has been in general use in all parts of the country. The very fact, that in the past 10 years there has been no general criticism or demand for change, indicates that on the whole the method has proved eminently satisfactory.

Of course many studies have been reported of other methods of examination than those recommended in Standard Methods. None of these however, has been as simple for general routine work, and none of them seems to give a more accurate determination of the actual sanitary condition of the oysters.

The two main questions that have been raised by these investigators are, first, the method of securing samples of the shell liquor, whether by the ordinary process of opening with a knife thrust in between the shells, or by drilling through the shell; and second, whether the analysis of the shell liquor gives a true measure of the presence of the coli-aerogenes group in the oyster.

On the first point it may be said that in most laboratories where oysters are examined, the workers find little difficulty in draining the shell liquor from the oyster by prying the shells slightly open with a regular oyster knife. The method is rapid, the liquor is not easily contaminated, and it requires a minimum of apparatus and sterilized equipment. Where many specimens are to be analyzed in a day the saving of time is important.

On the second point numerous investigations have shown that practically nothing is gained by attempting to get at the stomach and intestinal contents in addition to the shell liquor. If mem-

* Presented to the Committee on Standard Methods of the Laboratory Section of the American Public Health Association, at the Sixty-first Annual Meeting in Washington, D. C., October 24, 1932.

bers of the coli-aerogenes group are present anywhere in the oyster they will always be found in the shell liquor.

It is important, however, to prevent as far as possible the dilution of the shell liquor with the sterile blood of the oyster. If the shell liquor only is drained from the shell and the knife is not allowed to cut into the body, in an effort to cause a greater flow of fluid, this will be avoided. We have suggested below a slight change in the wording of Standard Methods to call attention to this.

In view of the fact that a considerable number of laboratories are now engaged in the analysis of other shellfish than oysters, such as clams, quahaugs, mussels, etc., and that methods applicable to oysters are not always suited to these other shellfish, it is recommended, first that the title of this particular part of Standard Methods be changed from "Standard Methods for the Bacteriological Examination of Shellfish" to "Standard Methods for the Examination of Oysters," and second that a sub-committee be appointed to draw up methods for the examination of these other shellfish.

Below you will find in detail the changes that I suggest in the present Standard Methods:

Change in title—Standard Methods for the Bacteriological Examination of Oysters.

OYSTERS IN THE SHELL

Collection of Sample—no change.

Transportation of Sample—no change.

Condition of Sample—substitute for the whole paragraph the following: "All oysters used for the analysis shall be in apparently good condition. No oyster from which the shell liquor has escaped, or whose shell is not tightly closed at all times while under observation shall be used for the analysis."

Technical procedure—line 9. Substitute the following for the rest of this section beginning "The oysters shall be opened," etc.—"With an oyster knife that has been sterilized by flaming, the shells of five oysters shall be pried open sufficiently so that all the shell liquor is drained aseptically into a sterile wide mouth bottle. Care shall be taken not to puncture the body of the oyster, in order to prevent the dilution of the shell liquor with the sterile body fluids. The composite shell liquor of the five oysters shall be shaken thoroughly and from it shall be prepared dilutions of 1 to 10, and 1 to 100, using sterile sea water or distilled water containing 2 per cent sodium chloride.

Five 1 c.c. portions of the undiluted composite shell liquor, five 1 c.c. portions of the 1 to 10 dilution and five 1 c.c. portions of the 1 to 100 dilution shall be added to fermentation tubes containing standard lactose broth.

The further procedure for the determination of the presence of members of the coli-aerogenes group shall be exactly as specified in *Standard Methods of Water Analysis*, and shall include the presumptive, partially confirmed, and completed tests as required.

Bacterial Counts—no change.

OYSTERS REMOVED FROM THE SHELL (OPEN OR SHUCKED STOCK)

Omit the last paragraph as published in the *American Journal of Public Health, July, 1922.* This paragraph does not appear in the reprints, also substitute "coli-aerogenes group" for "B. coli" in the third from the last line.

EXPRESSION OF RESULTS

Paragraphs 1, 3, and in the tables, substitute "coli-aerogenes group" for "B. coli."

FREDERIC P. GORHAM, *Referee*
Biological Laboratory
Brown University,
Providence, R. I.

APPARATUS FOR STUDY OF THE BACTERIAL BEHAVIOR OF AIR

W. F. WELLS
Harvard School of Public Health, Boston, Mass.

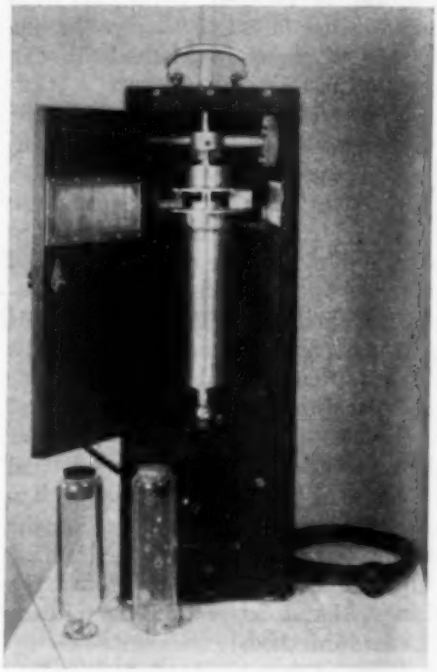
QUANTITATIVE examination of water for non-pathogenic bacteria has become a vital factor in the design, operation, and control of water supply systems, and the sanitary control of streams, bathing places, and shellfish grounds. If air bacteriology in a similar way is to determine in the future the hygienic characteristics of air supply and conditioning systems, it becomes necessary, because of the wide variability of bacterial results, to accumulate more extensive data than are at present available. This necessitates the development of a convenient method by which observers will obtain comparable results.

The author has developed a simple instrument for this purpose, utilizing the principles of the centrifuge in the separation of bacteria and other fine particles from gaseous suspensions such as air. This device operates somewhat in the manner of a milk clarifier which separates heavier particles from a liquid medium. The rapid revolution of a glass cylinder about its vertical axis causes a current of air to enter through a central axial tube, and to escape along a thin layer of nutrient medium supported on the walls of the cylinder. Particles suspended in the air are deposited on the medium. Colonies develop where the individual bacteria have been precipitated and can be counted with the naked eye.

Four independent operations are combined in one compact instrument:

1. Air flow is created.
2. The amount of air is measured.
3. The bacteria are collected.
4. The bacteria grow and can be counted on the collecting medium without separate plating.

The instrument has been subjected to approximately 200 tests, serving three general types of purposes. These are



to determine the characteristics of (1) atmospheric reservoirs, (2) conditioning equipment, and (3) bacterial sources of aerial contamination.

1. In the study of atmospheric reservoirs, a representative series of tests has been carried on at the laboratory during the past 6 months to determine the effect in one locality of seasonal, diurnal, and meteorological influences.

2. In the study of conditioning equipment, a most interesting observation has been the discovery that certain air blowers remove over 90 per cent of bacteria from air, while others

do not appreciably affect the bacterial content. With the increasing use of fans and centrifugal blowers, this fact may prove of practical importance.

3. In the study of the bacterial sources of aerial contamination, experiments have been made to determine under what conditions bacteria are given off by persons confined in a limited space. This inquiry leads also to an investigation of the physical, chemical and biological properties of droplets in connection with the theory of droplet infection.

VITAL STATISTICS

Increased Tuberculosis Mortality in Young Women in England—A noteworthy feature of the latest London mortality statistics is the lack of decline in recent years in mortality from pulmonary tuberculosis among young women.

In his annual report for 1927 the Registrar-General of England and Wales pointed out that women of 15 to 35 years of age formed the only section of the population in which an improvement in mortality from phthisis had not been observed in recent years. The cause of this phenomenon has not so far been adequately explained, though it has commonly been attributed to the increase of young women in industrial and commercial employment.

In London, according to the mortality rates set out in this report, the phthisis mortality among women has actually risen, between 1911–1913 and 1929–1931, by 23 per cent at ages 15 to 20, and 30 per cent at ages 20 to 25. In every other age group, and at every age among males, a decline is registered. When these deaths from pulmonary tuberculosis, at ages 15 to 25, are stated as a percentage of the deaths from all causes at the same ages, it is found that London shows the greatest relative increase in phthisis, the rural districts of the whole country showing almost no change between 1911–1913 and 1928–1930. The suggestion is that in the rural areas the occupation of young women has not changed to the same extent as in urbanized areas. Yet when the London figures are considered in more detail by the comparison of two groups of boroughs—those representing the poorest population and those representing better-class areas—it is found that the increase in the percentage of pulmonary tuberculosis as compared with all deaths among young women of 15 to 25 is much the same in both groups.

If change of employment from domestic work to commercial or industrial occupations or "industrialization" were alone the cause of the increased mortality from phthisis, the change should be far more conspicuous in the better class areas; for in these, the occupation figures of the census years 1911 and 1921 show that, in the 10 years intervening between them, the proportion of young women of this age engaged in domestic service decreased by nearly one-half, while in the poorer group of the population, the number employed in domestic service is comparatively negligible in both censuses.

An analysis of further available data shows that practically the whole of the increase in mortality from pulmonary tuberculosis in London has been among single women. The obvious explanation that young women suffering from phthisis do not marry is insufficient to explain the considerable divergence in mortality between the single and the married women. The possibility cannot be excluded that it is the young unmarried women who are likely to be most adversely affected by economic conditions. As (judging by mortality

rates) their resistance to pulmonary tuberculosis in the early years of adolescence is less than that of young men, it is only to be expected that when adverse economic conditions are added at this period of life, the young women will be much more affected than young men. If this is the explanation of the facts, an improvement in economic conditions affecting young women wage earners should be followed by a decline in this excessive mortality.

A factor which has not been considered in this report, but which may affect London to a peculiar degree, is internal migration. It has been shown that in all probability the relatively low phthisis rates in the urban areas and the relatively high rates in the rural areas among young adults—especially women—are related to the migration of the more physically fit from the country to the town, the town mortality being lowered, and the country mortality increased, by this movement of the healthiest. If, as there is some reason to believe, this selective migration to London has been slackening of recent years, the London mortality rates, especially from phthisis, are likely to be swollen owing to this relative absence of healthier recruits. Though this might be a practical explanation of the abnormal rise shown in the London rates, it obviously fails to be a complete explanation, since, as has been pointed out, the lack of decline in pulmonary tuberculosis in young females extends to the whole country.—*Lancet*, 16:866 (Oct. 15), 1932.

Aviation Mortality in 1931—The fourth report of the committee, on aviation of the Actuarial Society of America indicates that improvement has taken place in some aspects of the mortality experience due to flying. A summary of the findings made known by J. E. Hoskins, assistant actuary of the Travelers Life Insurance Company and chairman of the committee reveals that, in 1931, there was an improvement in mortality in civilian flying other than schedule flying, but no significant change in experience under schedule flying or in military flying.

The passenger death rate in schedule flying is given as 2 deaths per 100,000 passenger hours, or 5 per 100,000 flights. On the basis of the number of passengers carried on schedules and the number of deaths occurring in this type of flying, the experience in 1931 was 1 fatality for every 19,346 passengers carried. In 1930, the death rate was 1 fatality for every 17,396 passengers, while in 1929 it was 1 for every 9,633 passengers, and in 1928, 1 fatality for every 3,314. Stated on the basis of the number of flights, the death rate of passengers was 30 per 100,000 flights in 1928, 10 in 1929, 6 in 1930, and 5 in 1931.

In short sightseeing flights, the mortality rate, per 100,000 passengers, was about 3, and the rate per 100,000 passenger hours about 9. The death rate of passengers in pleasure flying was about 25 or 30 per 100,000 flights. In pleasure flying the death rate per flight seems very high, although it shows some improvement. In that connection it was mentioned in the report that much of the flying is done by inexperienced or unlicensed pilots.

A distribution of passenger fatalities by kind of flying in 1931 revealed 27 deaths under schedule flying for hire and 105 in pleasure flying. Passenger fatalities for the year totalled 183. The mortality rate of commercial pilots ranged between 20 and 25 per 1,000. Indications pointed to a lower rate for amateur pilots. The report states that a very small amount of annual flying by amateur pilots leads to a low rate of mortality per year, although perhaps a high rate of mortality per hour. The mortality among students was said to be relatively low, but the report adds that

after a license is obtained, and particularly after the student qualifies for a transport license, the mortality rate increases sharply for a time, then decreases gradually, but seems to level off with no appreciable improvement after about 1,000 hours in the air. It is indicated that the mortality rate of regular army and naval pilots is higher on an hourly basis than that of scheduled commercial pilots but lower than that of non-scheduled commercial pilots in general.

The mortality experience of licensed pilots shows that in 1929 there were 34 deaths for each 1,000 transport pilots, as against 23 per 1,000 in 1930, and 19 in 1931. It was thought that the improvement might have been due to a temporarily decreased amount of flying. The death rate among limited commercial pilots was 18 per 1,000 in 1929, 20 in 1930, and 9 in 1931. Among private pilots the death rate in 1929 was 12 per 1,000, as against 14 in 1930, and 8 for 1931.

The more experienced class of pilots has consistently exhibited the highest rate of mortality per year, while the less experienced class has in general exhibited the lowest rate. This is explained by the fact that the mortality rate increases with the amount of annual flying time, although not in direct proportion. Among transport pilots the mortality is said to be high for those with less than 500 hours' experience, while the available evidence indicates no material improvement in the annual mortality rate after 1,000 hours' experience has been passed. A relatively high mortality was said to exist among pilots of 2,000 or more hours' experience.

The report indicates that in 1930 there was a passenger death for every 4,300,000 passenger miles flown, as against 1 death for every 440,000,000 railroad passenger miles. In 1931 there was a passenger fatality for every 4,600,000 passenger miles flown.—*Insurance Field*, 61:5, 17 (Oct. 14), 1932.

A Comparative Study of Acute Anterior Poliomyelitis in Philadelphia in 1916 and 1932—This year has witnessed the second extensive outbreak of epidemic poliomyelitis in Philadelphia, the first being in 1916. In the intervening years no definite outbreaks have occurred, although the years 1930 and 1931, inclusive, exhibited an unusual number of cases. In fact, starting with 1929 there has been a steady yearly increase of cases from 45 in 1929, to 106 in 1931. In the 1916 epidemic there were reported 1,006 cases with 307 deaths, giving a case death rate of 32 per cent. To October 1 this year there have been 645 cases and 73 deaths, with a case death rate of a little over 11 per cent, as compared with a 30 per cent case death rate for the corresponding period of 1916. The fractional death rates, however, are hardly comparable, inasmuch as in 1916 the diagnostic criterion was paralysis, whereas in 1932 many cases in the preparalytic stage have been included.

Not only is the fatality rate lower in this year's epidemic, but the type of the disease is less severe, resulting in relatively less permanent paralysis. In both epidemic years 1 case each was reported in the month of June; 37 and 26 in July; 445 and 318 in August; and 365 and 306 in September of 1916 and 1932, respectively. The peaks in both epidemics were reached in the fourth week of August with 133 and 118 cases, respectively. The greatest number of cases reported in a single day was 36 on August 22, 1916, and 21 cases on August 28, 1932, almost a week later.

The parallelism continues fairly true as to location of first appearance and geographical distribution. Both epidemics seem to have originated during the month of July from a focus in

South Philadelphia, comprising the 1st, 2nd, 26th and 39th wards. In 1916 there was a coexisting focus in North Philadelphia in the 43rd ward, and in 1932 a similar accessory focus in Central Philadelphia in the 15th ward. In 1916 the disease expanded from the aforementioned foci to involve South, North, and Northwest Philadelphia, and North and Southwest Philadelphia. The banner ward in South Philadelphia was the 39th with 63 cases; in North Philadelphia the 43rd ward with 63 cases; in Northwest Philadelphia the 22nd with 79 cases, and in West Philadelphia the 40th with 42 cases. So far this year the same trend of expansion has been followed with the exception of an early simultaneous explosion of cases from the 15th ward instead of from the 43rd ward as in 1916.

The similarity of dissemination along certain ward boundaries that are highly congested may be explained as offering the maximum opportunity for contact infection. This year's wave has been a little later in getting started, it has not approached the 1916 incidence, and from present indications has already spent its force. Inasmuch as both outbreaks reached their peaks about the same time it may be deduced that their declines will relatively parallel, and that return to normalcy may be expected by December of this year. At this time the outbreak is actively receding, there having been but 45 cases reported for the week ending October 1, 1932, and the daily cases since then have been averaging 4 per day. — *Monthly Bull.*, Philadelphia Dept. of Health, Nov., 1932, p. 3–4.

A Tuberculosis Survey of the Territory of Hawaii, 1931—Tuberculosis, causing some 400 deaths every year in Hawaii, and approximately 200 deaths a year in Honolulu, is generally recognized as being one of the gravest of health problems in the Territory. In 1931, the death rate from this disease, per 100,000 population, was 106 for the Territory and 148 for Honolulu, compared with a rate of 75 in 1929 for the death registration area of the United States.

The average death rate from tuberculosis, by 5-year intervals, shows that there was a decline for the Territory of 9 per cent from 1900 to 1919 and a 31 per cent decline during the next 10 years. For Honolulu, the decline was more uniform. While the tuberculosis death rate has declined 62 per cent in the registration area of the United States during the past 30 years, the decline during the same period in Hawaii has been approximately 40 per cent, while for Honolulu a 78 per cent reduction has been noted.

When the tuberculosis mortality rate for Honolulu is corrected for residence, it is approximately 127 rather than 148 for 1931. It is obvious, however, that even after correction for residence, Honolulu's tuberculosis mortality rate is higher than that for most cities with populations of comparable size.

Hawaii's death rate from tuberculosis (106) is greater than that for any state on the mainland with the exception of Arizona (275.9), New Mexico (158.8*), Colorado (117.5*) and Tennessee (108.7). It should be noted that these four states are either health resort states or southern states. In the latter, a high negro death rate affects the figures.

The greatest number of deaths from tuberculosis occur among people in early adult life, the maximum number of deaths occurring in the age group from 20 to 39 years. It is the leading cause of death among persons from 10 to 50 years of age. Thirty-seven per cent of all deaths from tuberculosis are concentrated in the age group between 15 and 35 years, a group which contains

* 1930 death rate.

38 per cent of the population of the Territory. In the later age groups, although the actual number of deaths is small, the death rate from tuberculosis continues its upward trend to the oldest age groups, due to the relatively smaller number of persons living at those ages. This curve of tuberculosis mortality rate by age in the Territory shows a more marked rise in the older age groups than that for the registration area of the United States.—*A Tuberculosis Survey of the Territory of Hawaii and City and County of Honolulu*, 1931, pp. 15–19.

Hospitalization of Mental Patients—Results of enumerations of patients in state hospitals for mental disease for 1929 and 1930 were recently announced by the U. S. Bureau of the Census. The total number of patients on the books of the 164 state hospitals and 2 federal hospitals (St. Elizabeths Hospital, Washington, D. C., and Asylum for Insane Indians, Canton, S. D.) at the end of 1930 was 323,688. This number represents 236.1 persons per 100,000 of the general population.

It was said that the hospitals during 1930 cared for a daily average of 31,422 patients above their normal capacity. During 1930 the hospitals admitted 62,738 patients for the first time and 15,714 who had previously been treated in hospitals for mental disease. Men outnumbered women among first admissions, 144.8 to 100. Dementia praecox was the diagnosis in more than 20 per cent of the new admissions, 13,047 cases in 1930 and 12,187 during 1929.

Among readmissions manic-depressive psychosis was the most frequent cause, a situation attributed to the recurrent nature of the disease. There were nearly as many readmissions for this disease as new admissions; the latter amounted to 14 per cent of all new admissions.

In 1930, 38,538 patients were discharged; 29.6 per cent as recovered; 45.6 per cent, improved, and 10.9 per cent, unimproved. There were 26,923 deaths of mental patients in state hospitals in 1930, a mortality rate of 89.7 per 1,000 patients under treatment. The cost of operation for 160 hospitals in 1930 was $105,733,982, a per capita cost of $302.64. The personnel included 45,817 officers and employees.—*J.A.M.A.* 99:1363 (Oct. 15), 1932.

PUBLIC HEALTH ENGINEERING

PUBLIC HEALTH ENGINEERING MANUAL*

THE Committee on Public Health Engineering Manual was appointed to collaborate with similar committees of other sections in the activities of the Sub-committee on Manual of Administration of the Association's Committee on Administrative Practice. Lack of funds with which to function apparently has temporarily checked activities of Manual of Administration Sub-committee and for this reason your chairman has not formally organized the section committee and made arrangements for work assignments. He has, however, conferred with several members of the section with reference to the advisability of preparing a public health engineering manual to serve as a guide to administrative public health officials,

* Report of the Committee, presented to the Public Health Engineering Section at the Sixty-first Annual Meeting at Washington, D. C., October 25, 1932.

particularly in organizing public health engineering divisions, establishing sound policies of operation and proper allocation of funds for engineering activities. He has found enthusiastic endorsement of the project in every case.

It is believed that the section could best serve the public health engineers by preparing a complete manual entirely separate from the public health manual contemplated by the Committee on Administrative Practice. As our section contribution to a general manual, a digest of the public health engineering manual could be prepared; the one committee representing the section in both functions.

The preparation of a public health engineering manual is a sizeable undertaking and it might require from 3 to 5 years for completion. In order to be the most help to the Manual of Administration Sub-committee, it is believed that the first year's effort should deal with the administrative policies, organization, and budget requirements of an engineering division in each of the principal units of public health administration; the federal, state, county, and municipal departments of health. Material of this nature is what is most needed for a public health manual and at the same time it would serve engineers in obtaining proper recognition of their work and policies and in support of their budget requirements.

In later years special monographs on such individual public health activities as supervision and control of water supplies, sewage disposal, swimming pools, dairy sanitation, insect and rodent eradication, garbage and refuse disposal, environmental sanitation, smoke and other air pollution, industrial sanitation, heating and ventilation, plumbing, housing, noise control, lighting, city planning, disaster relief, and waterways pollution, could be prepared in collaboration with other section committees, the completed work to make up a public health engineering manual of real value to all engaged in public health work and more particularly to the engineers.

Ways and means of financing a complete manual are not yet apparent. It is believed that this is a matter to be left for later consideration when the material is ready. Difficulty is not anticipated in getting mimeographed copies made of the work recommended for next year's activities in collaboration with the Sub-committee on Manual of Administration. Special consideration should be made in appointing the Public Health Engineering Manual Committee of the section to see that its membership includes those engaged in federal, state, county, and municipal public health engineering work. Therefore, it is recommended that the committee be continued with instructions to proceed with the preparation of a manual as suggested above.

A. E. GORMAN, *Chairman*
F. A. BARBOUR
N. S. HILL
G. A. SOPER
E. W. STEEL
M. C. WHIPPLE

SEWAGE DISPOSAL *

THE Committee on Sewage Disposal regrets that it is unable to present a report at this meeting of the American Public Health Association. The subject chosen was "The Uses of Chlorine in Sewage Disposal." A large amount of preliminary work has been

* Progress report of the Committee on Sewage Disposal, presented to the Public Health Engineering Section at the Sixty-first Annual Meeting at Washington, D. C., October 27, 1932.

done, including the preparation of a very comprehensive bibliography and its arrangement by subjects, together with a study of the historical development. Owing to the demands on the time of various members of the committee, it has proved impossible to cover the ground and formulate a report at this time. The committee, therefore, requests that it be extended for another year, so that the material gathered can be properly studied and compiled, with a view to presenting a finished report at the meeting of the Public Health Engineering Section in 1933.

LANGDON PEARSE, *Chairman*
C. K. CALVERT, *Secretary*
A. M. BUSWELL
V. M. EHLERS
H. P. EDDY
C. E. KEEFER
F. W. MOHLMAN
WILLEM RUDOLFS
F. M. VEATCH
P. J. A. ZELLER

FELLOWSHIP AND MEMBERSHIP*

THE Committee on Fellowship and Membership, the purpose of which is to add to the Section membership from among the eligible engineers who are not affiliated with the American Public Health Association, was set up on a geographical basis as given below:

M. M. Cohn	New York, New Jersey, Pennsylvania
G. H. Ferguson	Canada
P. G. Galan	Mexico and Central America
A. E. Gorman	Michigan, Wisconsin, Minnesota, Illinois
C. E. Green	Oregon, Washington, Idaho, Montana, Wyoming
A. P. Miller	Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida
C. L. Pool	Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, Maine
L. B. Reynolds	California, Nevada, Utah, Arizona
E. W. Steel	Texas, Oklahoma, New Mexico, Colorado
E. C. Sullivan	Louisiana, Alabama, Mississippi, Arkansas, Missouri, Tennessee
M. W. Tatlock	Ohio, Indiana, Kentucky
E. L. Waterman	Iowa, Nebraska, North Dakota, South Dakota, Kansas

A letter notifying each committee member of his appointment and territorial assignments was mailed on February 24.

The names of the 777 engineering prospects used for promotion purposes were selected from the membership lists of the American Water Works Association, New England Water Works Association, the Chlorine Institute, and other smaller miscellaneous groups.

A letter signed by the chairman was mailed to the entire list of prospects on May 19. This letter offered membership and a subscription to the *American Journal of Public Health* for $5.00, with the option of obtaining a copy of the $3.00 *Year Book* of the American Public Health Association for an extra dollar. Several other books of interest to engineers were also included in this offer.

Immediately after the May 19 letter was mailed, a list of prospects in the various territories was sent to each committee member, together with a copy of the letter of invitation. The committee members were urged, with the clerical assistance of the Executive Office of the American Public Health Association, to follow up their prospects. Also, on June 7 a copy of the follow-up letter sent out by L. B.

* Report of the Committee, presented to the Public Health Engineering Section at the Sixty-first Annual Meeting at Washington, D. C., October 25, 1932.

Reynolds was forwarded to each member as a suggested form to use. At this time also the committee members were advised of any responses from prospects in their territories to the first letter of invitation.

It is definitely known that 8 of the committee members sent follow-up letters, 7 of which were prepared in the American Public Health Association office and mailed to the committeemen for signing.

On September 27 a second letter was mailed to 425 of the prospects in the states around Washington, D. C. This letter stressed the sessions of the Section at the Annual Meeting, and indicated that members of the American Public Health Association were entitled to reduced railroad fare to Washington. There was also mailed with this letter a copy of the advertisement used in engineering magazines and the list of papers to be discussed at the meeting.

As a result of these efforts, 21 applications were received up to October 20, all but a few of which were accompanied by membership dues. In addition, there were responses from 30 other individuals, 20 of whom indicated interest in membership but advised that they could not join at the present time due to the economic situation.

Your committee feels that further efforts with this group next year will bring in more new members, and presents this report with thanks for this opportunity to further the interests of the Public Health Engineering Section.

L. H. ENSLOW, *Chairman*
M. M. COHN
P. G. GALAN
G. H. FERGUSON
A. E. GORMAN
C. E. GREEN
A. P. MILLER
C. L. POOL
L. B. REYNOLDS
E. W. STEEL
E. C. SULLIVAN
M. W. TATLOCK
E. L. WATERMAN

INDUSTRIAL HYGIENE

Chronic Poisoning by Oxalic Acid: With Report of a Case and Results of a Study Concerning the Volatilization of Oxalic Acid from Aqueous Solution—This is a brief report of a case of chronic poisoning by oxalic acid. The victim, a man aged 53, was employed to clean automobile radiators, using a solution of oxalic acid. The solution was made by adding the crystals directly to the radiator and the concentration was apparently from 10 to 20 per cent. After approximately 1 year's work the man became completely disabled. The symptoms appeared to be nosebleed, headaches, vomiting, pain in the back, loss of weight, cough, generalized weakness, and nervous irritability. Reflexes were apparently normal; there was no swelling of the muscles and joints, and no tenderness on manipulation.

References to the literature would indicate that the toxic action of oxalic acid is brought about by its combination with calcium and the removal of the calcium from its availability to the body as a whole.—Charles D. Howard, *J. Indust. Hyg.*, XIV, 8:283–290 (Oct.), 1932. L. G.

Asphyxia From an Unexpected Cause—In this contribution a peculiar series of events are described in which deoxygenated air high in carbon dioxide found its way through a river bed to the working chamber of a caisson, leading to the death of 5 men engaged in

the chamber. The air had become deoxygenated by passage through the highly organic river bottom and was found to contain approximately 14 per cent carbon dioxide and 0.12 per cent oxygen.—E. L. Middleton, *J. Indust. Hyg.*, XIV, 8:291–294 (Oct.), 1932. L. G.

Carbon Monoxide Survey in Liberty Tubes, Pittsburgh—This is a report of a study of concentrations of carbon monoxide in the twin Liberty tubes at Pittsburgh. These tubes are approximately 5,900 ft. long and have a cross-sectional area of 468 sq. ft. each. Ventilation is accomplished by 8 Sirocco-type fans located in a fan house directly over the tunnel near its midpoint.

The carbon monoxide concentration determinations were made by the continuous carbon monoxide recorder developed by the U. S. Bureau of Mines. The study disclosed the fact that during the time of the peak load, brief traffic stops were occasioned by minor accidents and indiscretions of motorists, and that the concentrations of carbon monoxide during these periods often exceeded a desirable maximum.

The study recommends that the minimum speed of traffic should be 25 miles per hour and that pedestrians should be prohibited from using the tunnel during the time of such peak loads. There are ten other recommendations of lesser importance to which the reader is referred.—C. B. Maits, *J. Indust. Hyg.*, XIV, 8:295–300 (Oct.), 1932. L. G.

Modified Form of the Greenburg-Smith Impinger for Field Use, with a Study of Its Operating Characteristics—A modified form of the Greenburg-Smith Impinger apparatus is described. This instrument employs 75 c.c. of water or other sampling fluid, and is so designed that it operates with a constant sampling rate of air pressure ranging from 30 to 75 lb. without any regulation.—T. Hatch, H. Warren, and P. Drinker, *J. Indust. Hyg.*, XIV, 8:301–310 (Oct.), 1932. L. G.

The Quantitative Determination of Fine Soot Inhaled by Man—This is a description of a very simple apparatus consisting of a short bent piece of metal tubing approximately 10 to 12 cm. in length and 1.6 cm. diameter, threaded at one end to which a nut is attached. By means of this nut and a sleeve clamp a piece of filter paper is fastened so as to cover one end of the tube. Air is aspirated through the tube at a rate of approximately that of a breathing man.

After a suitable sampling period the filter is removed and compared with a set of color standards. These standards are prepared by suspending soot in chloroform so that the suspension contains 1 mg. of soot per c.c. of chloroform. By using smaller or larger volumes of the suspension, standards of known density are prepared which then serve as a basis of comparison for unknown samples taken at the workplace being studied.—A. I. Burstein, *J. Indust. Hyg.*, XIV, 9:339–344 (Nov.), 1932. L. G.

The Problem of the Possible Health Hazard of Lead-Weighted Silk Fabric—The increasing use of silk fabrics weighted with lead has suggested this problem to the authors, the purpose of this study being to determine the possibility of lead poisoning from silk weighted with lead salts.

The actual experiments took the form of determining under what conditions body fluids would affect the lead salts in silk fabrics and whether absorption of lead occurs in individuals wearing such material. The experiments were carried out by placing 6″ squares of the silk in flasks containing

measured amounts of liquid. The flask was then rotated in an electrically heated water bath for periods of over 3 hours duration at body temperature.

On removal from the bath, measured portions of the suspension were used for analysis. In neutral solutions it was found that the amount of suspended lead was extremely small and that the amount of dissolved lead was either zero or the barest trace, so that micro-chemical methods yielded very minute amounts. Urine, saliva, perspiration, physiological saline, tap water, and distilled water were tested at normal physiological pH's. Only in the case of saliva, tap water and distilled water micro-chemical methods yielded a positive test.

Studies of urine and feces of subjects wearing lead weighted silk garments indicated that no absorption of lead occurs even under extreme conditions, as a result of direct contact of such garments with the skin.—L. T. Fairhall and J. W. Heim, *J. Indust. Hyg.*, XIV, 9:317–327 (Nov.), 1932. L. G.

The Determination of a Single Index of Atmospheric Conditions in Relation to Physiologic Effects—The authors' succinct summary follows:

The physiologic responses of two subjects to moderate effective temperatures were ascertained for 3-hour periods. Tests were made at a wet bulb temperature of from 70° to 85° in moist air (96 per cent saturated) and dry air (40 per cent saturated). The pulse rate observed in the winter experiments agree well with the effective temperature scale, but not that observed in the summer experiments. Owing to acclimatization, the summer pulse was from 2 to 8 beats slower than in winter, the pulse in dry air being only 5 beats greater than in moist air of the same wet bulb temperature, as contrasted with the winter difference of 11 beats.

The rise of body temperature varied in accordance with the effective temperature in winter, but not in summer. The skin temperature of the face varied approximately with the effective temperature, but that of the trunk showed no sort of correspondence. The loss of moisture by perspiration varied closely with the scale.

One of the subjects performed heavy mechanical work, and his efficiency fell off slightly with rise of temperature. The fatigue experienced varied in accordance with the effective temperature.

It is pointed out that we may be able to obtain a single index to represent the physiologic response of the body to the combined effects of dry bulb temperature, wet bulb temperature, air movement and radiation; but acclimatization must always be taken into account.—

H. M. Vernon, *J. Indust. Hyg.*, XIV, 9:328–338 (Nov.), 1932. L. G.

Studies of School Ventilation—A single monograph includes Contributions Nos. 2 to 6, inclusive, of the reprints of the New York Commission on Ventilation whose work was financed by the Milbank Memorial Fund. All of the articles appeared in the various issues of the *American Journal of Hygiene* between July, 1930, and January, 1932. Their titles follow: (1) A Study of Ventilation and Respiratory Illness in Syracuse Schools; with an Analysis of Factors Affecting Criteria Used; (2) A Study of Ventilation and Respiratory Illness in Syracuse Schools; Rate of Air Flow and Room Temperature in Relation to the Health of School Children; (3) A Study of Ventilation and Respiratory Illness in New York Schools; Comparison of Window-Gravity Ventilation and of Unit Fan Ventilation with Varying Air Flow; (4) A Study of Rural School Ventilation in Cattaraugus County, New York; (5) Vasomotor Reactions to Localized Drafts. E. R. H.

Six Years of Tannic Acid Treatment of Burns—Davison announced his early observations on the tannic acid treatment of burns in 1925. An extensive literature has already appeared on the subject. The present author reports

on 310 consecutive cases at St. Luke's and City Hospitals, Cleveland.

From the work of others it appears that by this method the mortality of burns has been reduced from one-half to one-third, although during the first 24 hours the mortality rate is much the same regardless of the type of treatment used. The tannic acid method prevents subsequent complications to a large extent. In the 310 cases the mortality was 9.6 per cent. In 120 cases treated by various methods prior to 1926, the mortality was 14 per cent.

The exact technic and management of cases is described. Stronger tannic acid solutions (5–10 per cent) are recommended than have been the custom heretofore. — Donald M. Glover, *Surg., Gynec., Obst.*, 54:798–805 (May), 1932.

E. R. H.

Shorter Work Periods in Industry —Unquestionably the spreading or sharing of work is a most effective emergency measure during a business depression. Whether or not such a policy is necessary or desirable over a longer period is one on which opinions differ.

Statistics show that while improved agencies of production decreased the demand for industrial labor as much as 24 per cent between 1914 and 1925, the demand for manufactured commodities not only re-absorbed these but required an additional 1½ million workers.

Before any permanent change in hours is decided upon the possibilities in the following should be considered: Research, with its potentialities for creating new demands; infant industries that have not yet fulfilled their present demands; the amount of normal business activity necessary to replace old and obsolete equipment; the rate of pay per hour—if no increase then purchasing power will presumably decline, but if an increase then cost and prices will tend to increase; the fact that substituting a 6-hour for an 8-hour day has, by experience, increased labor demand only from 5 to 25 per cent, and not 33⅓ per cent as theoretically possible; any redistribution of work and pay roll will mean a sharing of both employment and unemployment, resulting in greatly increased underemployment; the proper use of increased leisure; the reduction in the use of expensive capital equipment; the difficulties attendant upon adopting a policy of shorter work periods almost simultaneously in order to prevent handicap, etc. Experience rather than preconceived opinion is first needed.—National Industrial Conference Board, Nov., 1911. E. R. H.

A Microscopic Study of the Tissues of the Albino Rat Following the Ingestion of Aluminum Salts— The conclusions reached in this study are based upon the findings in 80 test and 22 control animals which had received varying amounts of aluminum salts up to 3.6 per cent of feed by weight.

The protracted ingestion of aluminum salts in concentrations as high as 3.6 per cent has no deleterious effect upon the growth, reproduction, or blood picture of the white rat.

Livers of the animals examined contained a normal amount of iron.

There was no evidence of gross or microscopic pathology in the organs examined which could be attributed to the ingestion of aluminum salts.—Ernest Scott and Mary K. Helz, *Am. J. Hyg.*, 16, 3:865–870 (Nov.), 1932.

E. R. H.

FOOD AND NUTRITION

The Vitamin A, B, C and G Content of Concord Grapes—There has been previously reported work on the vitamin content of Thompson Seedless and Malaga grapes (*A.J.P.H.* 22:548, May, 1932). The Concord grapes tested in this experiment were representative of the fruit available to the consumer. The pulp and juice were fed in 2, 4, and 6 gm. daily amounts for vitamin A, B, and G content, and in 10, 12, and 15 gm. amounts for vitamin C. Eight rats were used for the vitamin A, B and G, and 7 guinea pigs for vitamin C.

It was found that 6 gm. of the edible portion of Concord grapes fed as the sole source of vitamin A induced but little growth in the rats during the 8-week test period. Very small amounts of vitamin B were found. Histological examination of the teeth of the guinea pigs showed no evidence of protection when 10, 12, and 15 gm. of Concord grapes were fed daily. No vitamin G was found.

Malaga and Thompson Seedless grapes were found to be fair sources of vitamin A, B, and C while a small amount of vitamin G was found. These differences may be due to a greater concentration of vitamin in the skins, which were retained in the former experiment and were discarded in the experiment on Concord grapes.—Esther Peterson Daniel and Hazel E. Munsell, *J. Agri. Res.* 45:445 (Oct. 1), 1932.

The Importance of Temperature on the Survival Time of Bacteria in Acid Foods—It is well established that rise in temperature results in increased bactericidal efficiency of the hydrogen ion. Studies were undertaken to determine the effects of low temperature storage of acid foods on the survival of pathogenic bacteria commonly associated with food poisoning. Typhoid strains were also included in these experiments.

The data obtained indicate an appreciable inhibition of the bactericidal effect of the hydrogen ion by such temperatures as —4° C. and —12° C. At such low temperatures organisms of the intestinal group may survive over a period of 7 days. This suggests the possibility of infection by this group of organisms in highly acid foods preserved only by storage at such temperatures. Danger is possibly decreased by the fact that massive infection of the product would be relatively rare. It follows, therefore, that preparation and handling of such foods should be subject to as rigid regulations and inspection as are applied to non-acid types of food.

It is concluded that decrease in temperature allows the survival of organisms of the intestinal group over dangerous periods of time at hydrogen ion concentrations rapidly lethal at ordinary temperatures.—Paul J. Beard and J. P. Cleary, *J. Prev. Med.*, 6:141 (Mar.), 1932.

The Vitamin B and G Content of Raw and Cooked Broccoli—In this experiment, only the edible portion of the plant was used. In determining vitamin B, albino rats, 28 days old, were fed a basal diet consisting of 58 per cent cornstarch, 18 per cent vitamin B-free casein, 10 per cent autoclaved yeast, 8 per cent filtered butterfat, 2 per cent cod liver oil, and 4 per cent Osborne and Mendel salt mixture. After 2 weeks on this diet each animal was then fed daily, 6 times a week, raw broccoli in the amount of 1, 2, 3, and 4 gm. and

equivalent amounts of the cooked vegetable.

Three gm. of the raw material contained 1 unit of vitamin B and induced a total gain in weight of 25 gm. during the test period. Four gm. of cooked broccoli contained no more vitamin B than 2 gm. of the raw material.

In determining vitamin G, the basal diet of Sherman and Spohn (*J. Am. Chem. Soc.* 45:2719, 1923) was modified by incorporating into it alcoholic extract of rice polish. One and two gm. portions of raw and cooked broccoli were fed. Raw broccoli contains a measurable quantity of vitamin G. Rats fed 2 gm. of cooked broccoli gained at a somewhat lesser rate, indicating slight destruction of this vitamin during cooking.—Hazel E. Munsell and Hilda Black Kifer, *J. Home Econ.* 24:823 (Sept.), 1932.

Vitamin C in Canned Citrus Products—In this experiment young guinea pigs weighing approximately 300 gm. were used, the dose being apportioned according to weight. The test was run for 90 days and autopsies performed to determine the Sherman scurvy-score. The oranges and grapefruit were tree-ripened, prepared promptly for canning, heat-exhausted, sealed in plain tin cans, and subjected to a short heat treatment. When the experiments were conducted the citrus products were from 7 to 10 months old.

One gm. per day (6 days a week) of canned orange juice fully protected against scurvy in a 90-day test period. Canned orange slices, canned grapefruit slices and canned grapefruit juice were slightly less effective than canned orange juice, slightly more than 1 gm. daily affording protection against scurvy. Commercially canned orange juice, orange slices, grapefruit juice and grapefruit slices, after 9 months' storage, contained fully as much vitamin C as fresh citrus fruits.—Carl F. Fellers and Paul D. Isham, *J. Home Econ.* 24:827 (Sept.), 1932.

Rickets in Rats. XIII. The Effect of Various Levels and Ratios of Calcium to Phosphorus in the Diet Upon the Production of Rickets—This is a study of the relative as well as absolute amounts of calcium and phosphorus in the diet in connection with production of rickets. Varying amounts of $CaCO_3$ and Na_2HPO_4 were given to 24 day old rats. After 21 days on the diet they were X-rayed, killed by bleeding, and blood serum analyzed for calcium and phosphorus.

The bones were examined histologically and the ash content determined. The calcium and phosphorus ratios were 1:1, 2:1, 3:1, 4:1, 6:1, and 8:1. In each ratio there was a variation in the level of both calcium and phosphorus from low to actually high amounts.

The results of this experiment show that for the same ratio a diet becomes less rachitogenic as the total salt level is raised; also that within the range the rickets are more severe the greater the ratio at a given level of phosphorus. The blood serum phosphate decreases with increasing ratio at each level of calcium, and the phosphate of the serum increases with the salt present. For a given level of calcium an increase in the ratio of calcium to phosphorus results in a decrease in bone ash. At a given ratio of calcium to phosphorus, increasing the salt level increases the ash in bones.—Helen Bennett Brown, Alfred T. Shohl, Edna E. Chapman, Catharine S. Rose and Esther M. Saurwein, *J. Biol. Chem.* 98:207 (Oct.), 1932.

CHILD HYGIENE

CHILD LABOR AND CHILD HEALTH

CHILD labor is serious at any time; but during the present crisis it is especially alarming, as it not only tends to disturb further the economic balance, but adds to the hardships and ill health of many children. It is important, therefore, to have clearly before us the picture which child labor presents today. Its newer aspects look upon health protection, vocational education, recreation, accident prevention, workmen's compensation, and proposals for health insurance.

Child labor has been defined recently by the National Child Labor Committee as "the work of children under conditions that interfere with their physical development, education, and opportunities for recreation. It is the employment of children at unfit ages, for unreasonable hours, under unhealthful or hazardous conditions, or while school is in session."

The White House Conference on Child Health and Protection devoted considerable time to the consideration of this subject. The report of the Committee on Vocational Guidance and Child Labor is replete with valuable information and recommendations.

"The task of the Child Labor Section of this Committee has been to set up certain standards for the health and protection of working children. It has reaffirmed the conviction expressed in the earliest child labor legislation that education and freedom from premature toil go hand in hand and must advance together, and it has given evidence to show that labor in immaturity thwarts normal physical development. It has agreed that children under 16 should not be permitted to leave school for work, and boys and girls of 16 and 17 in industrial employment should not be suffered to enter occupations known to be physically or morally hazardous, to work more than 8 hours a day or 44 hours a week, or to work at night, and minors should be given special protection from hazardous and injurious employments. In the light of present knowledge of the mental and physical needs of the child and the adolescent these standards represent a minimum. They should be looked upon as merely a point of departure for higher goals which the constantly growing contributions of scientific research will reveal."*

The 1930 United States Census states that over 2 million children between 10 and 17 years of age were gainfully employed at that time. The National Child Labor Committee feels that this figure is an understatement of the actual child employment as "it does not include children under 10 years, a considerable number of whom are engaged in street trades, tenement home work, and agriculture. Nor does it include the many thousands of children engaged in beet cultivation and other forms of industrialized agriculture whose work does not begin until after April 1, the date on which the Census was taken."†

The abstract of the report on chlid labor submitted to the White House Conference states that "children are employed by the hundreds and thousands in a great variety of non-agricultural occupations, chiefly in factories, but also in stores, offices, laundries, res-

* *Child Labor*, Report of Committee on Vocational Guidance and Child Labor of the White House Conference on Child Health and Protection, 1932, p. 10.

† *Child Labor Facts*, published by National Child Labor Committee in 1932.

taurants, as laborers and semi-skilled operatives in many kinds of manufacturing industries, as salesboys and girls, delivery boys, shipping clerks, bundle, messenger and errand and office boys and girls, newsboys, garage workers, filling station attendants, porters, railroad laborers, telegraph messengers, telephone operators, servants of all kinds, bootblacks, and barbers' helpers, and almost every other conceivable type of employment. Almost all of these occupations are unskilled, mechanical, and monotonous, offering the child little opportunity to acquire either experience or skill to increase his value as an adult worker."

The relationship between child labor and the strain and hazards of industry has been recognized for some time. In 1926 the United States Children's Bureau published a report on *Physical Standards for Working Children* in which the following statement appeared:

"The minimum age for the entrance of children into industry should be not younger than 16 years. Since it is recognized that the physiological and psychological readjustments incident to pubescence (which in the vast majority of cases are not completed until the 16th year) determine a period of general instability which makes great and special demands upon the vitality of the child, it is of paramount importance that he should be protected during this period from the physical and nervous strain which entrance into industry inevitably entails. The committee recognizes the fact that pubescence may occur early or may be very greatly delayed, and is convinced that the longer it is delayed the stronger is the indication of a physical stage during which it is highly inappropriate to subject the child to the strains of industry."

The White House Conference report states that "Thousands of accidents to young workers are reported annually, many of which result in permanent loss or loss of use of a member, in serious and permanent disfigurement, or in death. The high accident rate among young workers of 16 and 17 years of age deserves special attention. . . .

"The greater susceptibility, also, of young persons to tuberculosis is now being widely stressed, as well as the close relation existing between tuberculosis and sedentary, confining occupations, and tuberculosis and fatigue. No study of morbidity and mortality among young workers as they are related to employment has been made in recent years. The United States Bureau of Labor Statistics in a study of causes of death among cotton mill operatives, made in 1908, found that the death rate from tuberculosis among boys 15 to 19 years of age employed in cotton mills was nearly double that of boys not employed in the mills, and among girls was more than double. The installation of humidifying systems and of devices to remove lint from the air probably has resulted in an improvement in the conditions under which cotton mill operatives now work as compared with those of twenty years ago. But there is ample evidence that workers in various industries are still employed not only in places in which excessive heat or cold combined with dampness, dusty and lint-laden air, or poisonous fumes, create hazards, but in places where even ordinary standards of ventilation and sanitation are neglected."

Expert opinion of medical and health authorities is not lacking on the deleterious effects of child labor upon health and well-being. In *The Doctor Looks at Child Labor*,* Dr. Haven Emerson states that "even the school child, protected by interested and competent health supervision, suffers more severely from fatigue than from any other factor during the years of growth and development. Children in industry, whether

* Published by National Child Labor Committee in 1929.

indoors or out, show in exaggerated form damage to growth and development resulting from the still more aggravated fatigues of child labor. Competition either in agriculture or in factory production depends upon endurance and skill which only adult workers can provide without sacrifice of health."

In the same publication Dr. C. Floyd Haviland states: "Childhood is the period during which types of adult personality are determined. It is, therefore, of the greatest social importance to render conditions favorable during the early years of life for building evenly developed, well-balanced and thoroughly integrated types of personality. Child labor tends to warp, distort and inhibit personality growth, and thus too often it results in the development of malformed child personalities which are the forerunners of ill-balanced, partially integrated and poorly adjusted adult personalities. Individuals handicapped with such personalities contribute in undue measure to all the social problems with which society is confronted owing to their inability to meet adequately the demands of a complex social organization. Before the age of adolescence a child has a full-time job in learning how to live and to adjust to a world which presents many bewildering problems. A child's problems are no less real because they may not exist for the adult; and on the degree of success secured in dealing with them depends in large measure the degree of success which in later years is secured in dealing with adult problems. Child labor subjects a child to an unyielding discipline which takes no heed of special abilities and disabilities. It fails to provide the emotional satisfactions necessary to normal development. A child who is emotionally starved through child labor is one who as an adult is often found seeking denied but normal satisfactions through illegitimate means. A society which permits child labor is one which thus feeds the future ranks of asocial and anti-social individuals."

It is therefore the direct concern of all those interested in child health to work for minimum standards of protection of children in employment. These have been very well formulated by the National Child Labor Committee.

"The National Child Labor Committee* adopts the following standards which it considers the minimum necessary to protect children against premature or otherwise injurious employment, and at the same time leave them free for adequate education, physical development and preparation for occupational life. These standards do not apply to domestic or farm work done outside of school hours in or about the home of the child's parents; abuses connected with such work are part of the problem of domestic relations and should be dealt with through parental education, compulsory attendance laws, and, where necessary, through the courts which handle matters of domestic relations or juvenile protection.

IN NON-AGRICULTURAL OCCUPATIONS

"*Minimum Age*—No child under 16 years should be employed except that children 14 to 16 years may work outside of school hours in light occupations. School attendance should be compulsory for the entire term for a child under 16 years unless he has completed the course of study available, and the school term should not be less than 9 months.

"*Hours of Work*—No person under 18 years should be employed for more than 6 days or 44 hours a week, or for more than 8 hours in a single day; and for children between 14 and 16 years the combined hours for school attendance and employment should not exceed 8 hours in a single day.

"*Night Work*—No person under 18 years should be employed at night dur-

* *Where Work Begins*, published by National Child Labor Committee in 1932.

ing the hours between 7 p.m. and 6 a.m., except that boys 16 to 18 years may work until 10 p.m. in suitable occupations.

"*Work Permits*—No person under 18 years should be employed without a work permit based upon proof of age, employer's promise of work and a certificate of physical fitness with provision for subsequent physical examinations.

"*Dangerous Occupations*—No person under 18 years should be employed in dangerous or injurious occupations.

"*Workmen's Compensation*—Adult earning capacity should be considered as the basis on which wages are computed under the workmen's compensation laws for a minor permanently disabled; at least double compensation should be assessed against the employer of a minor who is injured while illegally employed.

IN AGRICULTURE

"*School Attendance*—No child should be employed during the hours when compulsory attendance laws require his attendance at school. School attendance should be compulsory for the entire term for a child under 16 years unless he has completed the course of study available, and the school term should not be less than 9 months.

"*Minimum Age*—No child under 14 years should be employed at any time away from the home farm, except that children 12 years and over may engage with their parents in light tasks for a few hours a day during a short season.

"*Hours of Work*—No child under 16 years should be employed away from the home farm for more than 8 hours in a single day; the combined hours for school attendance and such employment should not exceed 8 hours in a single day.

"*Dangerous Work*—No person under 18 years should be employed in dangerous or injurious agricultural work; and minors employed in agriculture should be included in the workmen's compensation laws."

PUBLIC HEALTH NURSING*

Expenditures for Public Health Nursing Services in Minnesota—An analysis of expenditures of public health nursing services in Minnesota for the year ending July 1, 1932, made by the Minnesota Department of Health shows that 32 county nurses averaged $145.50 monthly, or $1,697.50 yearly, for salaries; their average yearly transportation cost was $503.79, average cost of supplies $155.03, with average total cost for the service $2,458.67.

Sixty-three school nurses had an average monthly salary of $167.31 and a yearly salary of $1,505.85; their average yearly transportation expenditure was $103.59 and supplies $75.14; total cost of each service $1,652.01.

Twelve community nurses received an average of $140.85 monthly, $1,690.25 yearly. Their transportation expenses averaged $254.27 yearly, supplies $152.62, and total expenses for each service $2,027.21.—*Annual Report of Public Health Nursing Service,* Summarized by the Minnesota Department of Health, Division of Child Hygiene.

It will be interesting to see how the average expenditures for these public health nursing services during the year 1932–1933 contrast with the above figures, for it was not until the past summer that the salaries of public health nurses took such an alarming downward curve.

Health Department Nurses Are Behind Here—During the summer of 1932 a study was made of the qualifications of a selected group of Indiana public health nurses by the Division of Public Health Nursing of the State Board of Health. The measuring rod was "Minimum Qualifications for Those Appointed to Positions in Public Health Nursing," prepared by the Committee on Education of the National Organization for Public Health Nursing and endorsed by the Public Health Nursing Section, the Committee on Training and Personnel, and the Committee on Research and Standards of the American Public Health Association. Here is the result of the study:

	No. Nurses Employed	*Per cent of Nurses Qualified*
Rural (Nurses working alone or as supervisors)		
Employed by—		
Boards of education...	4	50
Private agencies (Red Cross, T. B. Association, etc.).....	44	40
County health department	8	17
Urban (Nurses working alone or as supervisors)		
Employed by—		
Boards of education...	39	30
Private agencies	43	44
City health departments	11	1

The School Nurse Again—Dr. Gillihan, Health Officer of San Luis Obispo County, Calif., says "The school nurse's activities are not to be measured so much by the number of defects she may discover as by the percentage of discovered defects she succeeds in having corrected." He says, too, that the school nurse "is not the one to make these corrections, but her training is such that she makes a

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

perfect 'liaison officer' between the school with its activities, the parents with the home life, and the various agencies, public as well as private, which are interested in securing these corrections."—Allen Gillihan, M.D., School Economics, *Weekly Bull.*, California Dept. of Public Health, XI, 39:154 (Oct. 29), 1932.

Dr. Gillihan is quite right in what he says as far as he goes but he leaves the impression in this article that a school nurse's most important function is getting defects corrected. Something might be said about the need of preventing defects in the first place. This recalls what Dr. Levy of New Jersey said at one of the American Public Health Association meetings in the Child Hygiene Section—that the best time to do preventive school health work is in the infant and preschool years; which could serve as an argument for a generalized nursing service for a community instead of just a school nursing service.

However, it needs to be more widely recognized that a school nurse is concerned with more than the finding and correcting of defects. One may judge what relation this phase of her work holds to her other duties by recounting the National Organization for Public Health Nursing objectives of a public health nursing service to school age groups:

1. To assist in communicable disease control by the recognition of early symptoms and by securing immunization.

2. To assist the physician in medical inspection and in the routine periodic physical examination of every school child.

3. To assist in securing the correction of defects and in promoting health.

4. To assist in securing special examinations and such follow-up as is necessary.

5. To participate in the promotion of hygiene and sanitation of the school plant.

6. To assist in securing proper instruction of pupils and parents in the principles of healthy living.

7. To provide or supervise adequate nursing care to all sick children.

Why Keep the Rural Nurse Rural?—A Kentucky public health nurse tells in the *Bulletin* of the Kentucky State Board of Health why she is glad she has "stayed put" for a number of years in one community instead of becoming a transient nurse which she once dreamed she would like to be. She feels now that one lives and fulfils oneself more fully in a small circle and finds therein in miniature all she would find in a big circle.

This nurse says if she were teaching prospective county public health nurses she would tell them that it takes a nurse a year to know her county, 2 years to really know her people, 3 years for them to know her, and then she is ready to begin work.

She proves the truth of this statement in her own case by recounting how the children gathered in an isolated school house in the hills, used to run screaming from windows and doors "taking to the hills, the trees, the rocks like little wild animals whose meeting place is invaded by a panther," when the public health nurse first arrived to make school inspections. As she says, "In those days a typhoid clinic was opened with prayer and we preached a sermon for every smallpox vaccination we gave."

She contrasts this with the situation 4 years later when she finds the pupils not only eager and willing to take their typhoid and diphtheria inoculation, but parents and grandparents, babies in arms, have walked miles in a blazing sun, 300 of them, to take advantage of the preventive measures they feared so intensely 4 years ago.

She says she wouldn't have missed for anything "this gradual building up, this cautious giving of confidence," the inimitable experience of having watched the "evolution of a people's faith."—Pauline Myers, R.N., In Retrospect, *Bulletin*, State Board of Health of Kentucky, V, 3:10 (Oct.), 1932.

Here perhaps is the answer not so much to "How to Keep the Rural Nurse Rural" which was argued in nursing magazines a few years ago, as "Why to Keep the Rural Nurse Rural." Public health nursing is educational work, and all education is slow in showing results. But part of the joy of working is seeing results—and the public health nurse who flits from place to place, even to take better positions, misses a great deal of the abiding joy of seeing obstacles in her path slowly overcome and the part she played in the "evolution of a people's faith" in public health.

EDUCATION AND PUBLICITY*

"What we need in the present emergency more than anything else is to spread among the people, and especially among the leaders, a true concept of the importance of public health in the social economy of the nation. This is obviously your duty. You, who represent the strength and leadership of the nation's health workers, must go back to your communities and broadcast the message I have just given you. Sound the alarm and arouse the public to a realization of the situation that is threatening. It is especially desirable that you win the support of your local medical societies, the chambers of commerce, the business men's groups generally, the women's clubs, and particularly the press. Make them all realize that the maintenance of the public health at high levels is vital to the public welfare."

By President Louis I. Dublin before American Public Health Association at Washington.

The New Chairman—At Washington Mrs. Mary Swain Routzahn, Russell Sage Foundation, was elected chairman of the Public Health Education Section for 1932–1933. Raymond S. Patterson, John Hancock Mutual Life Insurance Company, was reëlected secretary.

Send your ideas for next year's program to either of the above.

"Health Plays For School Use"—From American Child Health Association, 450 7th Ave., New York, comes this source list of plays and material about plays in teaching health. Five mimeographed pages. A copy *free*. From the introduction:

Dramatic expression is so congenial to children that it is natural for the teacher to have faith in a lesson cast in such a form.

It is important, if the richness and depths of a child's imagination and emotional nature are to be permitted free expression in the interest of learning, that the lesson in play form be not only truly imaginative, but also

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

that its factual content ring true, and that the action have, inherent in it, real dramatic possibilities.

In selecting the health plays here listed, an effort has been made to choose those most naturally childlike, most naturally dramatic.

Teachers should remember, however, that the richest vein of dramatic possibilities for learning always lies in the child himself—especially in the little child. His original dramatic expression, in words and action, of an idea that is clearly presented to him and that has become thoroughly familiar, will always have greater educational value than any dramatic activity prearranged for him by others.

What Happens To Them?—This is the cover title of a small folder from the Delaware County Tuberculosis Association, Chester, Pa. On the inside pages appears the following "obtained from a study made by . . .":

23 were dead, July 1, 1932, 4 of whom died in the County Home for the Poor.

25 are still in hospitals.

20 were living home or with relatives.

6 had removed from the county.

This is a small part of the story of the 74 persons who were listed as positive cases of tuberculosis at ONE of the tuberculosis clinics in Delaware County, Pa., in 1931.

57 Years Lost: The time recorded as lost through sickness by the 61 patients where this information could be obtained was 57 years, 1 month, 17 days.

30 Years in Hospitals: The records further showed that 30 years, 10 months, and 15 days had been spent in sanatoria and hospitals by this group of 74 patients.

Cost to County—$100,000: The average individual wage was $23.45 per week. Their combined earning capacity for the more than 57 years when they were unable to work amounted to $69,646.50.

The cost of hospital and sanatorium care at $20.00 per week for the time reported above reaches a total of $32,040.00.

Other Interesting Facts: 9 homes were broken up; 7 patients spent time in the County Home for the Poor; 16 families had 23 previous deaths from tuberculosis; 1 patient had recovered sufficiently to work full time; 6 were working part time; 181 patients were listed for State Sanatoria from Delaware County in 1931. Of this number about 20 per cent were children sent to preventoria.

As H.E.K., who sent it to me, says: "It is a bully idea, though some improvements could be made," especially in the lay-out of the original folder.

Quite different is the 8-page booklet from the Anti-Tuberculosis Association of Jefferson County, 2019 Ave. F, Birmingham, Ala.

"Facts and Figures About Tuberculosis in Jefferson County," the cover title, is not so good. The inside pages are headed: "The Gist Of It," "A Problem," "A Vision," "A Great Task," "A New Outlook." Well localized copy "which has been prepared primarily for the use of leaders in various groups." Very simple line sketches lighten the pages.

Grand Stand Seats For a Great Campaign—What may become a most extensive campaign of agitation and presentation touching the health field has just now been launched. The final report of the Committee on the Costs of Medical Care has sharply drawn the issues, and they will be capably laid before the country. Whether or not there is a continuing body, the vast interests involved will provide a self-sustaining public discussion of considerable vigor. It will be of value to health educators to observe from the beginning the growth of public opinion wherever it may go, whatever direction it may take.

Any number of folders describing the final report will be supplied free by University of Chicago Press, 5750 Ellis Ave., Chicago.

Where Is It in the Report?—Where is health education mentioned? Few department reports give adequate indexing to health education activities.

In one state department report "educational work" is mentioned under "Maternity division"; "public health education" under "Public health nursing division"; "educational activities,"

"articles published," and "lectures" under "Social hygiene division"; "educational activities" under "Tuberculosis division"; and then a number of sub-headings under "Public health education division." Likewise "research" and "studies" are merely sub-headings under different titles. Research workers, writers and others desiring to gather material from departmental reports will surely miss much material, unless they can take the time to dig through indexes or run through long reports, since many reports lack even inadequate indexes.

Is it not worth while to study how to make the contents of annual reports more usable by citizens and public health workers?

Journalism Students Writing Up Nurses—The American Nurses' Association reports a plan which health workers might try in any city or state which has a school of journalism.

All women members of the feature writing class at New York University School of Journalism have been assigned an interview with some nurse whose work is of more than local interest and importance. Professor Helen Scott Mann, who is in charge of the course in feature writing, will assist the students in placing their interviews in Sunday or daily newspapers in the communities covered.

State, district and alumnae associations are asked to name nurses and nursing services worth publicizing either locally or nationally. Names of individual nurses, together with a few facts about their experiences, hobbies, or backgrounds, should be sent to the Department of Public Information, A.N.A. If some approaching event will soon bring these women into prominence that should by all means be mentioned, as timeliness is a big factor even in the human interest or the interview type of newspaper or magazine article.

Is Men's Clothing a Health Problem?—"In Germany, while a dog's hair in winter represents only 1.4 per cent of its total weight, the winter clothing of a man represents about 10 per cent of his total weight," according to a statement from the League of Red Cross Societies, Paris. Is this heavy weight of clothing, by itself or in relation to the lighter weight of women's clothes, a factor in colds?

Discussion, Discussants and Discussion Leaders—Recently all chairmen of divisions of the National Conference of Social Work have received a "Handbook" of 44 mimeographed pages. Since many readers of this department are interested in planning and conducting meetings some quotations of what is said about discussion should be of interest.

The use and value of discussion—When planning the program for an individual meeting the Division Committee should definitely decide in advance whether it wishes discussion and what kind of discussion, and plan definitely for it. A discussion is valuable as it brings out various points of view, criticisms of the material presented or through the use of questions permits the speaker to make clearer some point in his paper or address that perhaps was not cleared up in the formal presentation. It also stimulates new constructive thinking and provides the means for the participation of a larger group in the Conference. Much of the value of discussion can be lost unless careful preparation is made.

Place of the Discussant or Commentator—For the purposes of the Conference let us define the discussant as a person who is asked in advance to discuss a particular paper. This person should have access to the manuscript he is to discuss at least three weeks in advance of the Conference. He should confine his remarks to a discussion of that paper rather than the presentation of additional material. As one studies past programs one finds that frequently people asked to comment on a given paper use this opportunity to present an entirely different subject or material that has very little relation to the paper presented. When a person is asked to discuss a particular paper definite time limits should be given and some indication as to the particular contribution desired from the discussant. Every effort should be made to see that he has a copy of the manuscript in ample time to prepare his part of the comment before the Conference.

It may be desirable, at long intervals, to have the full period following a speech (or

several speeches) wholly taken up by discussants who present different points of view or relate different experiences bearing on the subject.

In any case Discussants should not be called Discussion Leaders, or that period of time used by discussants labeled as Discussion.

Ethics In Hospital Publicity—An extensive "Report of the Committee on Public Relations," American Hospital Association, 18 East Division St., Chicago, reviews the publicity problems of the hospital, and the use of the principal media. "The committee believes that the submission of the following principles will guide hospitals and similar institutions in carrying on what may be regarded as ethical publicity":

Publicity by clinics, hospitals, sanatoria, and other semi-public medical institutions as to quality of work done implies unusual and exeptional ability and efficiency on the part of their professional staffs, and therefore is advertising of the medical men concerned. This type of advertising distinctly savors of quackery and is unethical.

Publicity by any such institution stating or implying that by reason of its exceptionally fine equipment and material resources it is able to, or does, give the public better medical service than similar institutions are able or willing to render, is advertising for purposes of self-aggrandizement. Statements of this type are frequently exaggerated and misleading and are detrimental to the best interests of the public, of the institutions concerned, and of true medical progress.

From time to time, hospitals, sanatoria, and other similar medical institutions must raise funds from an interested public for capital expenditure and maintenance. Furnishing the public with facts concerning such an institution, its work, its aims, and its ideals is legitimate and desirable. The public is interested in these facts and therefore is entitled to know them. Publicity dealing with these facts is ethical, provided, of course, that it refrains from any comparisons or superlative terms either direct or implied.

Publicity carried on by any one institution should be such as will be beneficial to all like institutions in the community. It should tend to develop public confidence in hospitals, sanatoria, and other medical institutions. It should be free from superlative or comparative statements and any implication of rate-cutting or unfair competition.

The report includes nearly 5 pages of bibliographical references to material which has appeared in hospital publications. 40 pp. *75 cents.*

What Will You Do About It?—Every worker in health education is threatened with a reduced budget, yet the need for health education is as great as ever. *What will you do about it?* And what might the Public Health Education Section do to help you?

How About Third Class Mail?—Have we carefully examined the possibilities? Many large business houses have been testing first class versus third class. A number of them have found that third class serves many uses as well as first class. A number of them assert that they will continue to use much third class even when first class is reduced to two cents.

Printed, multigraphed, or mimeographed matter may go at third class at 1½ cents for *two* ounces or fraction thereof. If an official permit is secured the same material will go for 1 cent—if mailed in lots of 20 lb. or not less than 200 pieces of the same kind. This permit privilege calls for sorting geographically outside of the mailing city, and the mail must be mailed at the post office and not dropped into a mail box.

The "postage saver" envelopes are safe and need not look cheap. There are plenty of good looking envelopes on the market.

Printed or duplicated letters sent third class may be signed and individually addressed just like a first class letter.

The simplest personal touch may be given by pen-writing "Dear Mr. Smith" (or whatever the name is) at the top. But some very successful advertisers are using the letter form, without being individualized.

To get the 1-cent rate any single lot of 200 or more pieces must contain the same enclosures.

What Is Health Education?—Annette M. Phelan presents some attitudes and principles in health education in the school, and tells us that

> Health Education is a way of living, mentally, emotionally, socially, and physically. It enters into and grows out of all child experiences in the school, the home, and the community. Health is a means to human happiness and achievement and is best thought of as such—not as an end in itself.—

"Health Education For All." *Public Health Nursing*, 450 7th Ave., New York. Dec., 1932. *25 cents.*

"Yes? What's the Name?"—Such a telephone greeting does not foster good will for a health agency—depression or no depression. Says A. M. Lockhart in *The Rotarian* (Dec., 1932):

> After all, telephone calls are substitutes for personal calls. The operator is merely removed from the sight of the person calling. The contact is otherwise personal. The telephone switchboard is indisputably one of the most important outposts of a firm's contact with the outside world. It's the port of entry for the majority of the total contacts a busy man makes during a day's work at his office.
>
> The stewardess of a switchboard functions as a reception committee of one—there to *greet*, if you please, all the callers who visit by means of the telephone. She is thus in excellent position to make or break a lot of good will.

A writer in *Printers Ink* (Dec., 1932) telling of some experiences by three business men calling at certain offices comments on the good or bad services by several information clerks.

As Mr. Lockhart says: "Receptions of this sort aren't limited to commercial houses, mind you. Secretaries of many professional men are similarly wanting." Might he have included health departments?

At the Foot of the First Column—We discover numerous readers who don't know where to address the editor of this department. Please turn to the first column of this department in any issue of the *Journal* and read the footnote. Whenever you think of it please send your material direct to that address. Then the A.P.H.A. need not spend extra postage in forwarding the material to the editor of this department.

REPORTING

"Bibliography for the Year," in Annual Report of New York State Dept. of Health, is a record of articles by staff members published in various periodicals.

Some of the page headings in a pamphlet describing and illustrating a hospital: "The Patient an Honored Guest," "The Comforts and Care of Home," "Keeping Down the Cost," "Baby Starts Life Right," "Human Skill in its Highest Attainments," "Economy and Efficiency of Operation," "For Correct Treatment of Disease or Injury," "The Convalescent Patient is Constantly Encouraged," "Correct Foods—Properly Cooked—Served Hot." In "An Ideal Hospital," Presbyterian Hospital of Colorado, Denver.

The 1932 "Year Book" of the United Hospital Fund of New York City, 122 East 22d St., New York, carries explanatory statements with all photographs, such as:

> Insulin Keeps Men At Work: Every year hundreds of breadwinners, who would otherwise be helpless invalids, are able to keep on the job with the help of free insulin treatments.

TIMELY TOPICS

"Forty Million Babies," the world's annual crop, with application to services rendered by *New Haven* to its share of that total. *Health*, Dept. of Health, New Haven. Sept., 1932.

"Poor Eyesight Causes Family Rows," by David Resnick. *Everybody's Health,* St. Paul. Oct., 1932. "Eye hazards to avoid in the home."

Poliomyelitis is given chief attention in Nov., 1932, issue of *Canadian Public Health Journal,* Toronto. *25 cents.*

"Man Controls Germs, Runs Amuck Himself." *Illinois Health Messenger,* Springfield. Nov. 15, 1932. Disease vs. automobile deaths.

"Danger to Health in Christmas Hysteria," by Thomas Myers, M.D. *Everybody's Health,* St. Paul, Minn. Dec., 1932. *10 cents.* "Nervous, physical collapse and disease epidemics often follow unwise holiday celebrations."

"A Half Century of Change," *Illinois Health Messenger,* State Dept. of Health, Springfield, Ill. Dec. 1, 1932. Changes in occupation, and "a change no less profound and far reaching than that of occupation, but for a different reason, has taken place in respect to the hazards of health and the causes of mortality in Illinois." May be adapted to other states and to cities.

PUBLICITY PRESENTATION

The Illinois Conference of Public Health Officers and Nurses, Dec. 15–16, 1932, included these topics: "The Public Health Job of the Parent-Teacher Association," "Non-professional People in Public Health Work," "Educating the Public in Health Matters" (Dr. W. W. Bauer), "Utilizing Organized Groups in a County Nursing Program."

"Popular Health Education vs. The Medical Charlatan" was presented at New Jersey Conference of Social Work by American Social Hygiene Assn.: "Can We Be Duped?" and "Campaigning Against Quackery."

Dr. Iago Galdston conducted a clinic on public speaking before the Social Work Publicity Council, Detroit, Nov. 8.

In *New Mexico Health Officer,* Bureau of Health, Santa Fe (Oct., 1932), Eleanor L. Kennedy, says:

> The object of publicity in public health nursing is to show the people what the nurse is doing for the improvement of their health in such a way that they've just got to help her and support her work. In addition, the knowledge of your work educates the people to a higher estimation of the value of health to themselves, and as a community responsibility.

DEPRESSION

"The Health of the People in a Year of Depression," by Dr. Louis I. Dublin. *American Journal of Public Health.* Nov., 1932. A presidential address.

"The Menace to National Health," by James A. Tobey. *Current History,* New York Times Bldg., New York. Dec., 1932. *25 cents.* The conclusions of the article "may seem pessimistic, but they should be regarded as a warning not to jeopardize the health of the nation."

"Unwise Economy May Affect Future Health," Dr. S. W. Sayer, New York State Dept. of Health, Albany. Radio talk. Enclose *3 cents.*

"Health Service Vital," a one-page statement of need of maintenance of health departments. Oregon State Board of Health. Nov. 22, 1932.

Depression cartoons appearing in the Health Bulletin Service of the A.P.H.A. have been used in various parts of the country.

BOOKS AND REPORTS

Alcohol and Man—*Edited by Haven Emerson, M.D. New York: Macmillan,* 1932. 451 pp. Price, $3.50.

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The conclusions of the authors as a group are fairly represented in the preface which, under the circumstances, make the best review that can be given. It is agreed that education in the basic facts concerning alcohol is essential to the best interest of man and his social organization; that there is much need of rewriting the texts and courses in physiology, hygiene and health offered to the children of the country in so far as the teaching of the effects of alcohol on man is included in state laws, or by regulation by boards of education; that an obligation rested on the contributors to assemble and present for the use of the educated laity facts concerning alcohol in its biological and human relationships, and that throughout the text, facts and opinions should be supported by available references, regardless of their bearing upon the current controversies as to the wisdom or desirability of continuing the 18th Amendment.

The authors have avoided the use of terms implying bias on one side or the other, and state that in no instance have they been aided financially, or supported in any way, by either the advocates or opponents of federal prohibition or of the liquor trade. They have included an excellent article by Drs. Langmead and Hunt of England on the effect of alcohol on the body's resistance to infection. The names of the writers of the various chapters give assurance that they are authoritative and embody the latest and most accurate results of research.

It is hard to speak too highly of this production. It comes at a time when exact knowledge will be of great value, though as pointed out by the editors of *Prohibition: A National Experiment,* the question of legal control is not likely to be settled on scientific evidence. However, exact knowledge must have an influence, even on the biased and emotional. We believe the volume will be of especial use to physicians and social workers, and we hope that those entrusted with the formulation of laws and regulations will also study it. For the doctors, the chapters on the physiological effects and therapeutic use of alcohol will be of particular interest.

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now stands. Under any circumstances, the question is a live one in both parties, and there is no question that strenuous efforts will soon be made to repeal the law. The result will be many and long discussions for and against the use of liquor.

The volume before us is an attempt to get at some of the underlying facts. For some 10 years the American Academy of Political and Social Science has published articles on the subject.

This book does not lend itself readily to review, containing as it does articles by 24 authors, ranging from Deets Picket and Clarence True Wilson on the one hand, to Rufus S. Lusk on the other. Several are written by men connected with the Bureau of Prohibition, for example, "The Illegal Liquor Traffic." It is possible to accept the statements as being correct as far as official records go, but as it is well known that there is no record of the illegal traffic—and that is what we are principally concerned in at the moment—it is manifest that the estimates are more than likely to be very far from the truth. On the one hand, Mr. Woodcock, Director of Prohibition, estimates the annual consumption of liquor at 800 million gallons, while the Association against the Prohibition Amendment estimates it at 1,100 million. The same difficulty exists in regard to the illegal traffic in narcotics. Other articles are from those who have no reason for bias, but there is conflict of opinions, and the best that can be said of most of them is that they are opinions, however sincere the authors may be, or however much they believe in the facts or alleged facts on which their ideas are based.

The editors in their "Foreword" tell us what we all know—that there are no complete statistical data available for a conclusive analysis of the effects of prohibition; that the question will probably never be settled by scientific treatment; and that the whole question is bound up with emotional attitudes which make dispassionate and scientific treatment difficult. However, whatever we may think of these discussions, and whether we believe all of them to be sincere or not, they furnish interesting reading and bring up many questions which those interested in temperance must consider.

Perhaps the most valuable part of the book consists of the 5 articles concerning the control of liquor in Canada, Great Britain, Sweden, Finland, and Russia. The medical articles concerning mortality and morbidity and mental hygiene are among the best and most useful. It is interesting to note the conclusion of unbiased writers that prohibition has had less effect on economic welfare—favorable or unfavorable—than is claimed either by its supporters or opponents; that it is extremely difficult, if indeed possible, to establish any direct relationship between modification of the 18th Amendment and the general agricultural situation; that no definite conclusion can be arrived at as to the direct part played by prohibition in increasing crime; that while there was a marked reduction in alcoholic psychoses in 1919–1920, there has been a notable increase in such psychoses as well as deaths since 1920, and an even more notable increase in alcoholism without psychosis, during the past 5 years.

This volume can be heartily commended to all who are interested in this subject—and what thinking man is not at this time? MAZŸCK P. RAVENEL

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This book contains sufficiently complete discussions of a few elements—hydrogen, oxygen, and nitrogen, and very brief mention of a considerable variety of inorganic compounds quite apparently chosen because they are likely to be encountered, at least in name, by nurses. Organic chemistry has not been neglected. Chapters dealing with carbohydrates, proteins, fats, and vitamins, are followed by discussion of foods and nutrition and secretions and excretions. A course of laboratory experiments is included. The author has done an almost impossible task in a distinctly acceptable manner.

JOHN F. NORTON

Mental Deficiency Due to Birth Injuries—*By Edgar A. Doll, Ph.D., Winthrop M. Phelps, M.D., and Ruth Taylor Melcher. New York: Macmillan,* 1932. 289 pp. Price, $4.50.

This is a timely volume which sets forth in well-balanced chapters the various factors contributing to injury of the nervous system incidental to childbearing. At present so much attention is being focused upon maternal and neonatal mortality that we are apt to overlook the serious damage due to birth injury in those who survive. Injury at birth is one of the prime factors in early infant mortality. Undoubtedly it also is the cause of a considerable number of cases of motor paralysis and mental retardation; "although they constitute but a small proportion of all mentally deficient children." The authors state that the risk "is especially serious among first born children, is present in an apparently normal birth as well as in those where natural labor is unusually severe or prolonged, and in those which require instrumental delivery."

The introduction and the chapter on Etiology indicate the varieties of injuries, the predisposing and causative factors, and the symptoms of intercranial injuries. The carefully selected case studies are particularly helpful in understanding the location and extent of the damage which may follow severe birth injuries. Chapters on Mental Tests and Measurements, Mental Estimates, and Mental Growth round out the volume. A practical consideration of physical therapy also is given.

The high quality of printing and illustrations of the Macmillan Company is maintained in this volume.

RICHARD A. BOLT

Medicine and the State. The relation between the private and official practice of medicine with special reference to public health—*By Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P. Baltimore: Williams & Wilkins,* 1932. 295 pp. Price, $3.50.

This book is the fourth and final volume of a series of "International Studies" conducted by the author for the Millbank Memorial Fund. It is, however, to a very considerable extent, independent of the other three volumes, although, necessarily, many of the conclusions expressed in this volume are based on facts published and analyzed in the previous volumes.

Briefly, the author reports the results of his survey of the existing relations between the practice of medicine in all of its branches and the activities of the various governments concerned in Western Europe with regard to the medical care of their peoples. In this connection he gives special consideration to four groups of medical services, which constitute the most recent advances in public health, i.e., the medical care of maternity, child health, and the treatment and prevention of tuberculosis and venereal diseases.

The operation of hospitals and clinics with special reference to their relations with the medical profession on one hand and the public and the state on the other is discussed at length. The chief varieties of medical practice, including group medicine, state medicine and insurance medical practice, are reviewed, analyzed and criticised. The author maintains emphatically that the health of the individual citizen is a communal as well as an individual concern. He concludes that the developments in medicine have been such as to require close coöperation between general practitioners and consultants. He also finds that the official phases of both prevention and treatment should come under a single directing authority.

Sir Arthur Newsholme is peculiarly well fitted to investigate and discuss the extremely important and pertinent subject of the relations between medicine and the State. His years of experience in health work in England, his varied contacts with the practice of medicine in his own country and abroad, and his knowledge and experience with social and governmental problems have gained him unexcelled qualifications for this work.

In some instances, the views expressed by the author might be regarded as open to criticism when applied to conditions in America. Nevertheless while the problems considered are those existing in Western Europe, still any health officer in this country should find in this book much food for thought and numerous sources of inspiration in dealing with the many administrative activities involving the private practitioners. GEORGE C. DUNHAM

Industrial Psychology — *Morris S. Viteles. New York: Norton,* 1932. 652 pp. Price, $5.50.

The subject of industrial psychology continues to engage increasing attention, as the present extensive volume of rather closely written pages, numerous tables, figures, and a limited number of photographs shows. We have already reviewed in these pages more or less similar works by the Gilbreths, Scott, Anderson, Burtt, Hill and others, and are pleased to receive this work from an academician who has had years of industrial experience of consulting and research nature in connection with various leading industries in the United States, and who combines an extensive European literature with that of American origin.

In the twenty years since Münsterberg presented the first systematic formulation of the problems and scopes of an industrial psychology, there has become available a wealth of experimental data and concrete achievements in increasing the effectiveness and happiness of man in industry. The present work reviews the new technics, new equipment, and new viewpoints, and discusses many of the fundamental problems of general and applied psychology as well as the relation of these to the industrial situation.

The work is divided into three main sections: The foundations of industrial psychology, fitting the worker to the job, and maintaining fitness at work—the total comprising 27 chapters. The plan has been to develop the subject somewhat in its historical aspects, to integrate industry and psychology, and to stress the inseparability of the two. Both manual and mental occupations are considered as well as the modifications which physiological and environmental influences introduce. The chapters on motives in industry, the maladjusted worker, and problems of supervision are monographic in themselves. There is a breadth and comprehensiveness about all of the subjects treated which is both informational and edifying, and throughout tempered with commensurate conservatism.

Written by one who is not only en-

thusiastic but thoroughly familiar with the scope and trend of his subject, the book lends itself to personnel, medical, and health specialists and all who are interested in efficiency from the human element standpoint.

Fortunately the numerous citations and acknowledgments appear both on the respective pages and in separate lists alphabetically arranged at the rear of the volume, to which an extensive subject index is added. The work is dedicated to two outstanding teachers at the University of Pennsylvania—Witmer and Twitmyer—while the publishers are to be commended on quality, style and format.

EMERY R. HAYHURST

A Text-Book of Human Physiology for College Students—*By August Krogh, revised and edited by Katherine R. Drinker. Philadelphia: Lea & Febiger,* 1932. 233 pp. Price, $2.75.

This small textbook originally published in Danish in 1908 is now reëdited and translated into English for the use of college students. A concise account of the physiological functions of the body is given in 13 short chapters and 83 experiments are outlined in the appendix for the elucidation of the subject matter of the text.

The opening chapter deals with the Chemical Constituents of the Human Organism and is followed by one on the Digestion and Absorption of Food. Each succeeding chapter is a logical outcome of the preceding one and profuse illustrations, the majority of which are taken from standard textbooks, contrive to make the book complete in itself. In the later chapters the physiology of the nervous system and of the special sense-organs is outlined.

Some statements could with advantage be improved; for example, solutions of polysaccharids (p. 20) and a solution of protein (p. 22) are said to be "slimy," and again "sugar passes unchanged through the (intestinal) epithelium" (p. 44). Less ambiguity would result if the word "dextrose" were substituted for sugar.

The book contains useful information, is excellently printed and may confidently be recommended as a suitable introduction to larger text-books on the subject.

JOHN WYLLIE

Pulmonary Tuberculosis—*By Maurice Fishberg. (4th ed.) Philadelphia: Lea & Febiger.* 1191 pp. Price, $15.00 for 2 Vols.

This book, in 2 volumes, is the best book now on the subject in the English language. Over 300 pages and over 100 new illustrations, largely roentgenograms, have been added. Etiology, pathogenesis, symptomatology, roentgenology and clinical forms are in the first volume.

One of the great assets of this book is the frankness and courage of the author. He questions whether the great modern antituberculosis campaign has really accomplished anything worthy of note. The number of the infected is no less today than 30 years ago. Again the tuberculosis mortality rates follow closely the general mortality rates.

His discussion of the tubercle bacillus is excellent, but mentions dissociation only under BCG. He still affirms that tuberculous exogenous (?) infection can occur only once and entirely sweeps aside the view, now widely held, that exogenous reinfection by inhalation is the usual cause of phthisis. The chapter on roentgenography is well done, and wisely illustrated. The importance of this method in the diagnosis of many lesions, the extent of the lesions, and their relations to the physical signs, is well brought out.

The second volume begins with the disease in children, points out that

the roentgenogram is of less value in diagnosis in infantile than in childhood tuberculosis, and of no practical value in the diagnosis of complicating intestinal tuberculosis. He finds heliotherapy of no value in the treatment of this condition. So much evidence has accumulated in this country and Europe to show that he is mistaken that it is only necessary to mention it as a blemish in a good book. Pregnancy is of little moment in arrested tuberculosis. Insulin in ordinary doses, he thinks, may cause focal reaction which the reviewer has not noted.

The reader is left to infer that some danger lurks in the immunizing use of BCG. Heliotherapy may provoke unwelcome reactions but the reviewer has never noted it in any case of pulmonary tuberculosis following the use of the ultra-violet ray lamp. Gerson's salt-free and high vitamin diet has no scientific foundation, he thinks, and no effect on the pulmonary disease. He attributes no value to tuberculin and sanocrysin.

The surgical treatment of the disease is fully dealt with, and here also his experience leads him to views different from those held by many. He cautions against too prolonged collapse of the lung in artificial pneumothorax and opposes the very beneficial operation of intrapleural pneumolysis. He leads one to infer that thoracoplasty does little more in many cases than prolong life. He dwells upon the dangers of oleothorax.

The reviewer differs from the author in many instances but he has found the book refreshing in its frankness and stimulating in its discussions. There is some suggestion that personal likes and dislikes have crept in here and there. For those engaged in public health work, we can heartily recommend many chapters in the first volume, for even when some statements are unorthodox—and they are not infrequently so—they lead to the clarification of the faith that is within one. The book represents a vast amount of study and a great clinical experience, though at times one is led to wonder if it has not been drawn a little too much from the more advanced cases. Every worker in tuberculosis should have access to these valuable volumes at all times. LAWRASON BROWN

Principles and Methods of Sociology —*By James M. Reinhardt and George R. Davies. New York: Prentice-Hall,* 1932. 685 pp., Price, $3.50.

Nothing illustrates the ill-defined character of sociology as a scientific discipline better than the extraordinary differences in the treatises pretending to set it forth in a systematic and fundamental manner. The above work is in this respect in line with expectations. Like most others also it has its own special claim to uniqueness and to attention. Without defining sociology, it presents in Part I, social process, some study of methods and an extended treatment of conflict and coöperation. In Part II attention is devoted to Factors Conditioning Society, and in Part III to Institutional Aspects of Society. The topics in these last two parts are those now commonly included in elementary college texts. The treatment is topical and systematic rather than exhaustive and original, being designed to give a comprehensive orientation to the student.

The authors tell us in the Preface:

> Primarily it is a philosophy of history in which a new interpretation of economics derived from statistical and mathematical analysis takes the central place. It sees the "residues" (after Pareto) of the historic process largely in terms of the economic consequences of trade relations.

This is a too ambitious statement of the actual achievement, for this philosophy is far from systematic state-

ment in the text. Nevertheless, this viewpoint serves to explain the numerous very interesting statistical studies inserted throughout the text. These are done with a neatness and clarity that could not be surpassed. If they seem at times to be thrust into the text at points that appear to me merely the most convenient rather than the strictly logical ones, they will nevertheless be generally widely approved not merely as contributions to our understanding of social phenomena but as excellent teaching devices. By means of them the beginning student will learn what is meant by a correlation coefficient and something of how it is found.

F. H. HANKINS

Child Labor. *Report of the Subcommittee on Child Labor of the White House Conference on Child Health and Protection. New York: Century,* 1932. 592 pp. Price, $5.00.

In this report there has been brought together, for the first time, all available material bearing upon the subject of child labor in the United States. The data has been assembled largely from reports of previous studies and surveys published from time to time by the United States Children's Bureau and the National Child Labor Committee. Unfortunately it was not possible to obtain the census figures for 1930, as undoubtedly there have been certain changes in industrial and geographical distribution since 1920.

The volume is arranged conveniently for reference purposes. It contains an exhaustive bibliography and an excellent index. Part I considers the non-agricultural occupations with detailed analyses, a general summary, and recommendations. Part II is devoted to employment of children in agriculture. Part III clearly depicts the hazardous occupations and discusses industrial accidents and the administration of workmen's compensation. This subject is continued in Part IV, where more detailed consideration is given to the administration of laws affecting employment of minors. Recommendations for employment certificates, school attendance, and industrial inspection are given. The concluding part is composed of supplementary reports, which include the New York law on employment of children in theatrical performances and the physical condition of children entering industry in a number of cities.

This volume is a good reference book for those who desire a clear idea of what the child labor movement in this country really means.

RICHARD A. BOLT

Body Mechanics: Education and Practice. *Report of the Subcommittee on Orthopedics and Body Mechanics. Robert B. Osgood, M.D., Chairman. Publication of White House Conference on Child Health and Protection. New York: Century,* 1932. 166 pp. Price, $1.50.

This report has assembled a great deal of scattered material on body mechanics in relation to physical fitness and health of children. The term body mechanics is preferred to that of posture, which the committee feels has a more limited and less precise meaning.

> Body mechanics may be defined as the mechanical correlation of the various systems of the body with special reference to the skeletal, muscular and visceral systems and their neurological associations. Normal body mechanics may be said to obtain when this mechanical correlation is most favorable to the function of these systems.

It is pointed out that poor body mechanics may be developed very gradually and their immediate effects not noticed on account of partial or complete compensation. The various factors contributing to poor body mechanics are discussed.

About half of the volume is taken up by a reprint from the United States Children's Bureau on *Posture and Physical Fitness* by Dr. Armin Klein and Leah C. Thomas. The appendix contains also a reprint from the Boston Public Schools on a *Course in Physical Education for the Day Elementary and Day Intermediate Schools.*

The report cautions against accepting any one type of individual or group of individuals as the standard norm for good body mechanics. Different types of body build should be compared and evaluated. Detailed recommendations and suggestions for corrective exercises are set forth, which are of value in guiding those concerned with the growing child.

The Sub-committee concludes that

> . . . further investigation and larger and longer surveys are most to be desired, but the Sub-committee is of the opinion that the evidence presented strongly suggests that there exists an intimate association between good body mechanics and good functional health and between poor body mechanics and poor functional health, and that this association may well represent a causal relation in many instances.

RICHARD A. BOLT

Environmental Factors in Negro Elementary Education—*By Clark Foreman. New York: Norton,* 1932. 88 pp. Price, $1.00.

The place of environmental factors in conditioning results of educational achievement tests is recognized by most psychologists. In this treatise the author has presented a description of environmental conditions which he believes profoundly modify the educational achievement of negro children in southern elementary schools. He concludes from the data collected that evidence exists to the effect that as the environment of negro children approaches in similarity to that of white children they approximate the norm of white children in educational achievement. The significance of health as a factor is admitted (pp. 50–55) but the difficulty of securing evidence as to the effect of health conditions on achievement compels the author to dismiss this consideration with little attention. This volume should be of interest to students and other workers in the field of negro education.

FRANKLIN O. NICHOLS

An Introduction to Practical Bacteriology—*By T. J. Mackie and J. E. McCartney. (3rd ed.) New York: Wood,* 1931. 421 pp. Price, $3.50.

This book measures up fairly well to its subtitle, namely, "A Guide to Bacteriological Laboratory Work." Although it is only 3 years since the second edition appeared, the authors have subjected the book to a rather thorough overhauling. Some of the material of the former edition has been omitted and considerable new information added. Having the needs of the junior student in mind, the text has been divided into large and small type matter, the first having to do with the more essential and fundamental part of the subject.

With the exceptions of a few diagrams, illustrations are omitted, the book being intended as a guide in a laboratory course where the various apparatus, microscopic appearances, cultural characteristics, biochemical and serological reactions, are adequately demonstrated. An attempt is made to emphasize the more important methods used in routine bacteriological diagnosis, those which the authors have found most serviceable being recommended. Due attention has been given to the diagnosis of tropical infections.

This publication has value other than as a guide, for it deals rather freely with principles. Both the general student and the practitioner will find it useful, although it was written more especially for the bacteriologist. C. F. ADAMS

Proceedings Sixth Annual Conference, The Maryland-Delaware Water and Sewerage Association, Cumberland, Maryland—1932.

The proceedings of the Sixth Annual Conference of the Maryland-Delaware Water and Sewerage Association contains a valuable symposium on stream pollution control in which the laws, policies, accomplishments, coöperative studies, agreements and the like in the states of Delaware, Pennsylvania, West Virginia, and Maryland are explained and amplified. Other papers discuss the admission of industrial wastes to sewers, the influence of soils, rocks and minerals upon water potability, activated carbon, and a new dam. A. P. M.

BOOKS RECEIVED

STREPTOCOCCI IN RELATION TO MAN IN HEALTH AND DISEASE. By Anna W. Williams and William H. Park. Baltimore: Williams & Wilkins, 1932. 260 pp. Price, $5.00.

POLIOMYELITIS. By International Committee for the Study of Infantile Paralysis. Baltimore: Williams & Wilkins, 1932. 562 pp. Price, $6.00.

FARM AND VILLAGE HOUSING. Report of Committee on Farm and Village Housing. The President's Conference on Home Building and Home Ownership, Washington, D. C. 1932. 293 pp. Price, $1.15.

A GUIDE TO HUMAN PARASITOLOGY FOR MEDICAL PRACTITIONERS. By D. B. Blacklock and T. Southwell. Baltimore: Williams and Wilkins, 1932. 271 pp. Price, $4.00.

MANUAL OF MICROBIOLOGY. By Walter L. Obold and Margaret M. Diehm. Philadelphia: Davis, 1932. 140 pp. Price, $1.25.

STUDIES OF SCHOOL VENTILATION. Collected reprints of the New York Commission on Ventilation. New York: Teachers College, 1932. 35 pp.

OUTLINE OF PREVENTIVE MEDICINE. For Medical Practitioners and Students. 2d ed. By the Committee on Public Health Relations, New York Academy of Medicine. New York: Hoeber, 1932. 462 pp. Price, $5.00.

BACTERIOLOGY FOR NURSES, WITH A LABORATORY MANUAL. By Royall M. Calder. Philadelphia: Saunders, 1932. 285 pp. Price, $2.00.

CORRECTION OF DEFECTIVE SPEECH. By Edwin Burket Twitmyer and Yale Samuel Nathanson. Philadelphia: Blakiston, 1932. 413 pp. Price, $3.50.

UNIVERSITY STUDENT HEALTH SERVICE. Publications of the Committee on the Costs of Medical Care: No. 19. By Don M. Griswold and Hazel I. Spicer. Chicago: University of Chicago Press, 1932. 114 pp. Price, $.90.

HOME OWNERSHIP, INCOME AND TYPES OF DWELLINGS. The President's Conference on Home Building and Home Ownership. Washington, D. C., 1932. 230 pp. Price, $1.15.

MEN AGAINST DEATH. By Paul de Kruif. New York: Harcourt, Brace, 1932. 363 pp. Price, $3.50.

FINAL REPORT OF THE COMMISSION ON MEDICAL EDUCATION. New York, 1932. 560 pp.

CANCER: THEN AND NOW. By New York City Cancer Committee. New York: Chemical Foundation, 1932. 80 pp. Price, $1.00.

TEACHING NUTRITION TO BOYS AND GIRLS. By Mary Swartz Rose. New York: Macmillan, 1932. 196 pp. Price, $2.00.

PLANNING AND BUILDING THE CITY OF WASHINGTON. Edited by Frederick Haynes Newell. Washington: Ransdell, 1932. 254 pp. Price, $2.00.

LIFE BEGINS AT FORTY. By Walter B. Pitkin. New York: McGraw-Hill, 1932. 175 pp. Price, $1.50.

FOOD AND CHARACTER. By Louis Berman. New York: Houghton Mifflin, 1932. 364 pp. Price, $3.50.

MEDICOLEGAL CASES. Abstracts of Court Decisions. 1926–1930. Edited by William C. Woodward. Chicago: American Medical Association, 1932. 1336 pp. Price, $7.00.

pH AND ITS PRACTICAL APPLICATIONS. A New Handbook and Reference Work. By Frank L. LaMotte, William R. Kenny and Allen B. Reed. Baltimore: Williams & Wilkins, 1932. 262 pp. Price, $3.50.

FACTS AND QUACKERY IN HEALING. By Morris Fishbein. New York: Covici Friede, 1932. 384 pp. Price, $3.50.

HOUSING OBJECTIVES AND PROGRAMS. Addresses by President Hoover, Mrs. Jane Deeter Rippin and Secretary Wilbur. Washington, D. C.: President's Conference on Home Building and Home Ownership, 1932. 345 pp. Price, $1.15.

SYLLABUS OF MEDICAL HISTORY. By Victor Robinson. New York: Froben Press, 1933. 110 pp. Price, $1.00.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Symposium on Dentistry and Health—This series of papers discusses the relations of dentistry and nearly every specialty in medicine, ending with the health triangle, "physician, dentist and patient."

ATKINS, R. T. *et al.* Diseases of Common Interest to the Dentist and Oto-Laryngologist. New York State J. Med. 32, 21:1221 (Nov. 1), 1932.

Undulant Fever in Ireland—In a series of papers the status of *Br. abortus* infection, in man and animals, and its spread through milk are presented at length.

BIGGER, J. W. *Br. Abortus* Infection in Ireland. J. State Med. 4, 11:642 (Nov.), 1932.

Influenza Results—During epidemics of influenza the death rates for diseases other than influenza and pneumonia (about 40 per cent of the excess mortality) rise to present a picture strikingly similar in time distribution to the curve of the influenza and pneumonia rates. Excess deaths in which influenza was given as a contributory cause account for only half the increase.

COLLINS, S. D. Excess Mortality From Causes Other Than Influenza and Pneumonia During Influenza Epidemics. Pub. Health Rep. 47, 46:2159 (Nov. 11), 1932.

Practical Mental Hygiene—Traveling diagnostic clinics in Massachusetts have accomplished the tremendous job of giving mental examinations and diagnoses to 41,000 mentally retarded school children. The value of this work to society must be great.

DAYTON, N. A. The Walter E. Fernald Plan for the Examination of Retarded School Children. New Eng. J. Med. 207, 21:914 (Nov. 24), 1932.

Future Medicine and Health—The long awaited final report of the Committee on Costs is summarized. The recommendation for publicly supported hospital centers providing medical services for all will not warm the hearts of those, like this reviewer, who don't like hospitals, and who want the comfort and security of the family doctor. However, the insistence upon really adequate health services will receive a loud Amen.

EMERSON, H. Medical Care for All of Us. Survey 68, 17:629 (Dec. 1), 1932.

Plague in Peru—Study of many years of endemic plague in Peru reveals that the incidence is greatest in cities in which the rat harborage of buildings is worst, regardless of climatic location. The value of rat proofing is well illustrated.

ESKEY, C. R. Epidemiological Study of Plague in Peru. Pub. Health Rep. 47, 47: 2191 (Nov. 18), 1932.

Dental Caries—We learn in the first of these two papers that caries is a "saprophytic phenomenon occurring in morphological fissures, developmental enamel faults, or in the permeable necks of teeth," and that the prevention of decay can be accomplished only by rendering the mouth unsuitable to the saprophytes concerned or by breeding a race free from crevices, faults and receding gums. The second paper outlines the dietary principles now generally accepted by hygienists.

FISH, E. W. and MELLANBY, M. Aetiology of Dental Caries. Brit. M. J. No. 3746 (Oct. 22), 1932.

Amebic Dysentery—House flies may be a factor in the spread of *E. histolytica* in the community studied, but none of the animals closely associated with man act as reservoir hosts, or assist in the transmission of, the parasite. So concludes an interesting study.

FRYE, W. W. and MELENEY, H. E. In-

vestigations of *Endamoeba Histolytica* and Other Intestinal Protozoa in Tennessee: IV. A Study of Flies, Rats, Mice and Some Domestic Animals As Possible Carriers of the Intestinal Protozoa of Man in a Rural Community. Am. J. Hyg. 16, 3:729 (Nov.), 1932.

School Health Results—A school superintendent presents the evidence he finds of the improvement in the health of school children following upon the adoption of the health program.

HAMMOND, W. E. Checking the Efficiency of a School Health Program. Pub. Health Nurs. 24, 11:592 (Nov.), 1932.

Early Indian Health—This story of the health conditions and medical practices among the American aborigines will prove a valuable historical reference. It is significant that the settlers caught no epidemic diseases from the Indians, whereas they gave them plenty.

HRDLICKA, A. Disease, Medicine and Surgery Among the American Aborigines. J.A.M.A. 99, 20:1661 (Nov. 12), 1932.

Milk Bottle Caps—Will two caps on a bottle of milk keep out more bacteria than one? The answer is, yes, and 16 pages of argument, tables and graphs are taken to prove it. "Under certain conditions," concludes the paper, "milk in bottles sealed with the ordinary disc type cap may present a definite hazard to health." So another bogey is arising to make us more skeptical about the milk we bring ourselves to drink.

ISAACS, M. L. and ZERBER, I. A Comparative Study of Milk in Bottles with Single and Double Caps. Am. J. Hyg. 16, 3:806 (Nov.), 1932.

Testing Adults for Tuberculosis—The technic of a quantitative tuberculin test for adults is described. The author claims for it a 90 per cent accuracy equal to that of the routine test applied to children.

KING, R. B. A Tuberculin Test of Value in Adults. New Eng. J. Med. 207, 19:831 (Nov. 10), 1932.

Postpartum Care—"The ultimated welfare of the parturient woman cannot be secured by good antepartum and intrapartum care alone, but requires equally good postpartum attention." This conclusion precedes the enumeration of the factors that constitute good after-care of the mother.

LITZENBERGER, J. C. Preventable Invalidism Following Childbirth. J.A.M.A. 99, 21:1740 (Nov. 19), 1932.

Harvey's Contribution to Public Health—It seems that we are indebted to Harvey for far more than the demonstration of the circulation of the blood which laid the foundations of physiology and modern preventive medicine, for the movements which his work initiated were the beginning of present-day health administration.

NEWMAN, G. The Debt of Preventive Medicine to Harvey and the College of Physicians. Lancet 223, 17:877 (Oct. 22), 1932; Brit. M. J. No. 3746 (Oct. 22), 1932.

Bacterial Transformations — To date seven different pathogenic bacteria have been transformed from the visible state to the filter passing stage and back again to the ordinary condition. The practical application of these studies is set forth in this excellent non-technical radio talk on this new but highly important subject. It is well worth reading by health workers.

SIMONDS, J. P. Making Bacteria Invisible and Its Significance. Sci. Month., Dec., 1932, p. 481.

NEWS FROM THE FIELD

PUBLIC HEALTH NURSING CONTEST

THE winner of the first prize in a case story contest conducted by *Public Health Nursing* was Mary H. Emberton, a supervisor on the Visiting Nurse Association staff in Denver. There were 124 manuscripts submitted. The second prize was awarded to Charlotte M. Young, R.N., whose manuscript was submitted by Florence E. McClinchey, of Mount Pleasant, Mich. Edith M. McCarthy, of Medford, Mass., won third prize.

STUDENT HEALTH ASSOCIATION MEETING

THE 13th Annual Meeting of the American Student Health Association was held December 28–29, in New York City, in conjunction with the Society of Directors of Physical Education in Colleges, the American Football Coaches' Association, and the National Collegiate Athletic Association.

WESTERN BRANCH MEETING

THE Western Branch A.P.H.A. meeting will be held in Pasadena, Calif., May 29–31.

NEW JERSEY EDUCATION SURVEY

DR. ROBERT P. FISCHELIS, Secretary and Chief Chemist of the Board of Pharmacy of the State of New Jersey has been appointed a member of the State Educational Survey Commission. The duties of the Commission are to survey the educational system of the state and to propose recommendations for an essential program of modern education and methods of financing it. The Commission includes the State Commissioner of Education, a number of school superintendents and principals and a number of prominent laymen, all of whom will serve without pay. Thomas N. McCarter, President of the Public Service Corporation of New Jersey, is the Chairman of the Commission and Albert Payson Terhune, the well-known author, is one of the members.

STANDARDS APPROVED

TWO sets of standards "Essential Features in the Design of Sanitary Drinking Fountains" and "Minimum Qualifications for Those Appointed to Positions in Public Health Nursing" have been formally approved by the Committee on Research and Standards and by the Governing Council of the American Public Health Association. These standards which have already been printed, the first in the *1930 Year Book* and the other in the *American Journal of Public Health*, May, 1931, were prepared by the Committee on Plumbing of the American Public Health Association together with the Conference of State Sanitary Engineers and the Committee on Education of the National Organization for Public Health Nursing respectively.

NEW YORK STATE SEWAGE WORKS ASSOCIATION

THE Fifth Annual Meeting of the New York State Sewage Works Association will be held in New York, January 17. In the evening the association will join the Sanitary Engineering Division of the American Society of Civil Engineers at their annual dinner at the Hotel McAlpin.

THE SIN OF BEING DULL

BEING dull is one of "The Six Deadly Sins," attributed by Guy Holt to those who make and distribute books.

The sin of being dull. That is peculiarly a writer's sin, but it is one which publishers too often encourage. We overlook, I fear, the fact that anything no matter of what moment is lifeless if it be not interestingly presented. We begin in the schools by instilling in our children a hearty distaste for knowledge, when so little imagination could translate almost any subject into a challenge to curiosity. And we carry the deadly tradition on into the field of adult books, and wonder why people, no longer under compulsion to read, prefer ignorance to tedium. Happily this condition is changing. Men eminent in research and scholarship have been found who write dramatically and invitingly of science, of history, even of economics. But the time has not yet come when in every publishing house a book of serious import must pass the two-fold test of accurate scholarship and of interest.—

Publishers' Weekly, New York. Oct. 15, 1932. E. G. R.

PERSONALS

DR. E. R. SHAFFER, F.A.P.H.A., has been appointed Chief of the Bureau of Child Hygiene of the Ohio State Department of Health.

RAY H. EVERETT, F.A.P.H.A., was elected Executive Secretary of the District of Columbia Social Hygiene Society, assuming office on November 15.

MRS. HUGH BRADFORD, of Sacramento, Calif., will represent the National Congress of Parents and Teachers at the World Federation Conference, to be held in Dublin, Ireland, July 29–August 4, 1933.

DR. IRA O. CHURCH, member A.P.H.A., Health Officer of Contra Costa County, Calif., has been appointed assistant medical director of Alameda County under an emergency ordinance recently passed.

DR. FRED P. HELM, formerly of Miami, Okla., has been appointed Health Officer of Topeka, Kans., succeeding Dr. Aurel Goodwin, who resigned.

DR. TILLMAN C. BRITT, member A.P.H.A., of Washington, N. C., has been appointed Health Officer of Surry County, to succeed Dr. Malcolm T. Foster, Mount Airy, on leave of absence.

DEATHS

DR. CALVIN L. COOPER, member A.P.H.A., and Kansas City, Mo., Health Director, died December 1.

EDITH VIVIAN EVANS, Director of the Occupational Therapy Department of the Neurological Institute of New York at the Medical Centre, and President of the New York State Association of Occupational Therapy, died November 27.

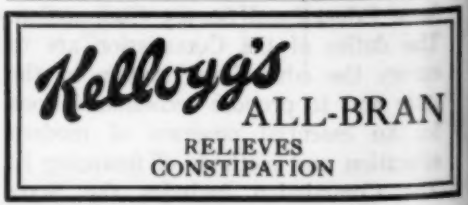
CONFERENCES

January 16–18, Fifteenth Annual Water Works Short School, Temple, Tex.

January 17, New York State Sewage Water Works Association, New York, N. Y.

February 6–10, American College of Physicians, Seventeenth Annual Clinical Session, Montreal.

April, American Physiological Society, Cincinnati, Ohio.

July 1–7, National Education Association, Chicago, Ill.

July 29–August 4, World Federation of Education Associations, Dublin, Ireland.